Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider… ● How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? ● How does the math I am learning in the classroom relate to the real-world? ● What does a good problem solver do? ● What should I do if I get stuck solving a problem? ● How do I effectively communicate about math with others in verbal form? In written form? ● How do I explain my thinking to others, in written form? In verbal form? ● How do I construct an effective (mathematical) argument? ● How reliable are predictions? ● Why are patterns important to discover, use, and generalize in math? ● How do I create a mathematical model? ● How do I decide which is the best mathematical tool to use to solve a problem? ● How do I effectively represent quantities and relationships through mathematical notation? ● How accurate do I need to be? ● When is estimating the best solution to a problem?	*Students will understand that…* ● Mathematical skills and understandings are used to solve real-world problems. ● Problem solvers examine and critique arguments of others to determine validity. ● Mathematical models can be used to interpret and predict the behavior of real world phenomena. ● Recognizing the predictable patterns in mathematics allows the creation of functional relationships. ● Varieties of mathematical tools are used to analyze and solve problems and explore concepts. ● Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. ● Clear and precise notation and mathematical vocabulary enables effective communication and comprehension. ● Level of accuracy is determined based on the context/situation. ● Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. ● Concrete understandings in math lead to more abstract understanding of math.

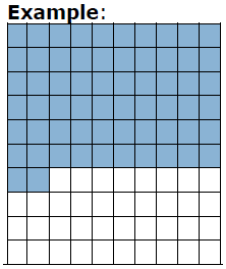
Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 1 - Whole Numbers and Decimals
Unit Title: Whole Numbers and Decimals Course: 5th Grade Mathematics Brief Summary of Unit: In this unit, students will write whole numbers in different forms and compare and round numbers according to their place value. They will also represent thousandths as three-place decimals or as fractions as well as compare and round decimals to the thousandths. Textbook Correlation: Chapter 1 - Whole Numbers Chapter 8 - Decimals Time Frame: approximately 4-5 weeks

Transfer
Students will be able to independently use their learning of whole numbers and decimals to solve real-world problems such as a household budget, sport averages, determining change, calculating costs, and measuring with metric units.

Meaning	
Essential Questions	Understandings
Students will consider… **5.NBT.1** ● How can the same digit have a different value? ● How does rounding help us with estimation? When is estimation appropriate? ● How do you decide which place to round the numbers if you are not told what to do in a real world situation? ● What are some real world situations that use hundred thousands? millions? ten millions? **5.NBT.3** ● How can you compare two decimals with different numbers of digits? ● How do the values of decimal digits in each place compare? ● When is it best to write a number in decimal notation? ● When is it best to write a number as a fraction? **5.NBT.4** ● How does place value help me round? ● What is the best tool to use for this rounding problem? ● Why do we round? **5.NBT.7** ● How does estimating help me decide if my sum or difference is reasonable? ● What is the best strategy to use when adding or subtracting decimals? Why can a zero be added to the end of a decimal without changing the value of the number?	*Students will understand that…* **5.NBT.1** ● 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. ● In the real world, very large quantities can be represented using hundred thousands, millions, and ten millions. ● There is a purpose for estimation. ● Estimation requires an understanding of rounding. ● An estimate is sometimes a better solution than finding an exact answer. **5.NBT.3** ● A digit that is further to the right of the decimal place has a smaller value than a digit that is closer to the right of the decimal place. ● Fractions and decimals are related. **5.NBT.4** ● The benchmark you focus on changes depending on the place value you are rounding to. ● A number line and a grid are appropriate tools for representing rounding. **5.NBT.7** ● Students use the same base-ten place value system for adding, subtracting, multiplying, and dividing decimals that they use for adding, subtracting, multiplying, and dividing whole numbers.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.NBT.1** ● Difference between digit and number ● Decimal points (periods) of place value – ten millions, millions, hundred thousands, ten thousands, thousands, hundreds, tens, ones, tenths, hundredths, thousandths ● Rounding ● Estimating **5.NBT.3** ● Thousandths place value ● Equivalent forms ● Benchmarks	*Students will be able to….* **5.NBT.1** ● Count by 10,000s and 100,000s up to 10,000,000. ● Read and write numbers up to 10,000,000 in standard form, expanded form, and written form. ● Identify the value of digits in numbers up to 10,000,000 (could be extended through billions). ○ For example, the 8 in 845 has a value of 800 which is ten times as much as the 8 in the number 782. In the same spirit, the 8 in 782 is 1/10th the value of the 8 in 845. ● Compare and order numbers to 10,000,000 (could be extended through billions). ● Identify and complete a number pattern. ● Find a rule for a number pattern. ● Round numbers to the nearest thousands ● Use rounding to estimate, or check sums, differences, and products. ● Locate numbers on a number line. ● Use related multiplication facts to estimate quotients. ● Use various problem solving strategies, including model drawing and guess and check. **5.NBT.3** ● Read, write, compare, and order decimals and fractions to thousandths. For example, students can compare 0.207 to 0.26 by thinking “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.” ● Identify equivalent forms of a decimal number.

	● Rewrite decimals as fractions and mixed numbers in simplest form. For example, 0.72 is equivalent to: 72/100, 7/10 + 2/100, 7 x (1/10) + (1/100), 0.70 + 0.02, 70/100 + 2/100, 0.720, 7 x (1/10) + 2 x (1/100) + 0 (1/1000), 720/1000. ● Write a decimal using expanded notation. (21.245 = (20 x 10) + (1 x 1) + (2 x 1/10) + (4 x 1/100) + (5 x 1/1000) ● Relate the size of decimal numbers to common benchmarks, such as 0, 0.5 (0.50 and 0.500), and 1. ● Interpret the base ten value of each decimal place value.
5.NBT.4 ● Halfway benchmarks ● Base ten relationship within place value system ● Decomposing numbers and rounding are related	**5.NBT.4** ● Justify rounding explanations with multiple strategies: making drawings and numerical equations. **Example**:  ● Explain the math behind the rules including decimal placement and base ten. ● Round precisely. ● Round a decimal number to any place.
5.NBT.7 ● Decimals are part of a whole ● The decimal point separates the whole number from the fractional part	**5.NBT.7** ● Explain the process of a strategy used in solving an addition or subtraction problem using decimals; for example, place value charts, number lines, base ten blocks, and discs. ● Solve addition and subtraction problems using decimals up to the hundredths place.

Standards Alignment

MISSOURI LEARNING STANDARDS

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

5.NBT.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.

5.NBT.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., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

5.NBT.4: Use place value understanding to round decimals to any place.

5.NBT.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.

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

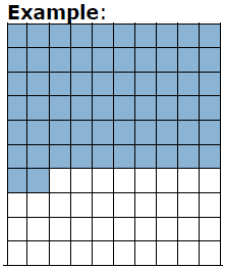
Unit 2 - Multiplication and Division of Whole Numbers and Decimals
Unit Title: Multiplication and Division of Whole Numbers and Decimals Course: 5th Grade Mathematics Brief Summary of Unit: In this unit, students will familiarize themselves with the use of a calculator, using patterns to help multiply and divide, simplifying numerical expressions using the order of operations, and solving real-world problems using multiplication or division involving whole numbers and decimals. Textbook Correlation: Chapter 2 - Whole Number Multiplication and Division Chapter 9 - Multiplying and Dividing Decimals Time Frame: approximately 6-7 weeks

Transfer
Students will be able to independently use their learning to multiply and divide in the real world such as cook a meal, purchase a home, pay bills, find cost per unit and purchase multiple items with the same cost.

Meaning	
Essential Questions	Understandings
Students will consider… **5.OA.1** ● Why are parentheses, brackets, and braces used? ● Why is there a specific order to solving the expression instead of always solving left to right? ● How does the placement of parentheses, brackets, or braces affect the result? **5.OA.2** ● What real-world situation would I use to demonstrate the expression? ● What verbal expression would correspond with the numerical expression? **5.OA.3** ● How do numerical patterns relate to each other? **5.NBT.1** ● How can the same digit have a different value? **5.NBT.2** ● How does removing 0's from the smallest place value relate to division? ● How does adding 0's to the smallest place value of whole numbers relate to multiplication? ● How does the placement of a decimal point relate to multiplication or division? ● Why does it make sense to use exponents?	*Students will understand that…* **5.OA.1** ● There is a specific order to solving expressions to guarantee that the solution will be the same regardless of who solves the problem. **5.OA.2** ● A verbal expression corresponds with a numerical expression. ● An expression is a series of numbers and symbols (+, -, x, ÷) without an equals sign. ● An expression is a form of representing a number. **5.OA.3** ● Numerical patterns are generated from given rules with a specific starting number. ● Relationships exist between corresponding terms from the two patterns. **5.NBT.1** ● 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. **5.NBT.2** ● Whenever a 0 is added to or removed from the smallest place value(s), the place value of the nonzero digit(s) shifts. ● Whenever a decimal point is moved, the place value of the digits shifts. ● Using exponents is an efficient way to represent repeated multiplication.

● How does moving the decimal point relate to multiplying and dividing by powers of 10? **5.NBT.4** ● How does place value help me round? ● What is the best tool to use for this rounding problem? ● Why do we round? **5.NBT.5** ● How does estimating help me decide if my product is reasonable? ● What is the best strategy to use when multiplying? ● Why do we multiply? ● When is it appropriate to use a calculator? **5.NBT.6** ● How does estimating help me decide if my quotient is reasonable? ● What is the best strategy to use when dividing? ● Why do we divide? **5.NBT.7** ● How does estimating help me decide if my sum, difference, product, or quotient is reasonable? ● What is the best strategy to use when adding, subtracting, multiplying or dividing decimals? ● Why can a zero be added to the end of a decimal without changing the value of the number?	**5.NBT.4** ● The benchmark you focus on changes depending on the place value you are rounding to. **5.NBT.5** ● The distributive property can be used to break numbers apart to find products; the relationship between multiplication and repeated addition. ● The standard algorithm can be the most efficient method for multiplying multi-digit whole numbers. ● Fluently means finding the correct answer using an efficient method and being able to explain the reasoning behind computing the answer. ● A calculator is an efficient tool to perform mathematical operations and check estimations. **5.NBT.6** ● Division is finding an unknown factor; the dividend is the product, the divisor is the known factor, and the quotient is the unknown factor. ● There are various ways to find the quotient of a division problem; some are more efficient than others. **5.NBT.7** ● Students use the same base-ten place value system for adding, subtracting, multiplying, and dividing decimals that they use for adding, subtracting, multiplying, and dividing whole numbers.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.OA.1** Order of Operations: Parentheses Brackets Braces Multiplication or Division (Left to Right) Addition or Subtraction (Left to Right)	*Students will be able to….* **5.OA.1** ● Evaluate expressions using order of operations. {10+[(3 – 1) + 7] } – (8 ÷ 1) ● Explain the reasoning of how they solve expressions. **5.OA.2** ● Verbally describe expressions. ● Describe a real-world situation when interpreting the expression. ● Given a verbal or written description of a mathematical process, write the process in mathematical notation. The process should include at least 2 operations and the use of parenthesis. (For example, write an expression for "first add 8 and 7, then multiply by 3".) ● Given a mathematical statement, be able to verbally and in written form, describe the process. (For example, given 2 x (7 - 3), write a description of the process.) ● Interpret the numerical meaning of an expression without having to compute the answer. (For example, recognize that 4 x (3 + 8) is 4 times the size of (3 + 8).
5.OA.3 ● numerical patterns ● rules	**5.OA.3** ● State the rule for each numerical pattern. ● Generate a table of data. ● Generate terms in a sequence following a given rule. ● Verbally compare and explain the relationship between two patterns.
5.NBT.1 ● Difference between digit and number ● Periods of place value ● millions, hundred thousands, ten thousands, thousands, hundreds, tens, ones, tenths, hundredths, thousandths	**5.NBT.1** ● Identify the value of digits in numbers. ● Compare the value of a given digit in two different numbers. For example, the 8 in 845 has a value of 800 which is ten times as much as the 8 in the number 782. In the same spirit, the 8 in 782 is 1/10th the value of the 8 in 845.

5.NBT.2 ● Exponents ● Power	**5.NBT.2** ● Take multiples of 10 and write them in exponential form. For example, ○ $25 \times 10^3 = 25 \times (10 \times 10 \times 10) = 25 \times 1{,}000 = 25{,}000$. ○ $36 \times 10 = 36 \times 10^1 = 360$ ○ $36 \times 10 \times 10 = 36 \times 10^2 = 3600$ ○ $35{,}000 \div 10^3 = 35{,}000 \div 1{,}000 = 35$. ● Explain the patterns of multiplication and division. ○ For example, $523 \times 10^3 = 523{,}000$ The place value of 523 is increased by 3 places. ● Construct an explanation for what happens to the place value of a number when it is multiplied or divided by a power of 10. ● Multiply and divide tenths and hundredths by multiples of 10, 100, and 1000.
5.NBT.4 ● Halfway benchmarks ● Base ten relationship within place value system ● Decomposing numbers and rounding are related	**5.NBT.4** ● Justify estimations with multiple strategies including using a number line or grid. **Example:**  ● Round precisely. ● Round a decimal number to any place. ● Estimate decimal sums, differences, products, and quotients.
5.NBT.5 ● Various multiplication strategies including but not limited to: distributive, area model, partial products, and traditional algorithm. ● Efficiently means using a reasonable amount of steps to get the product. ● Estimate	**5.NBT.5** ● Use the traditional algorithm to multiply multi-digit whole numbers (the boundary is a 3-digit by a 2-digit number). To challenge students, go further. ● Multiply correctly, efficiently, and with flexibility. ● Use a calculator to add, subtract, multiply, and divide. ● Estimate products to justify answers.

5.NBT.6

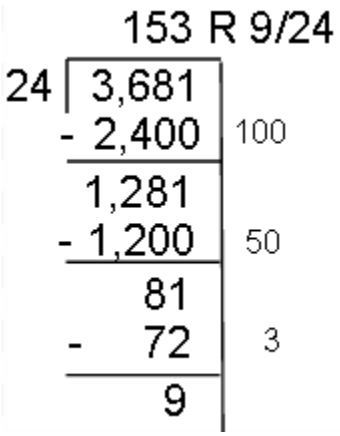
- Various division strategies, including but not limited to: rectangular arrays, area models, partial quotients, traditional algorithm, and short division.
- Use estimation to justify quotients
- Relationship between multiplication and division

5.NBT.6

- Choose the most effective division strategy:
  - using equations
  - rectangular arrays
  - area models
  - partial quotients
  - traditional algorithm
  - short division

For example:

Partial Quotients Strategy



- Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors
- Construct an explanation for why the traditional algorithm, area model, partial quotients, and rectangular arrays all are equivalent methods for determining a quotient.
- Use efficient strategies to solve multi-step multiplication and division real world problems using model drawing and other problem solving strategies.
- Express and interpret the product or quotient of a real world problem appropriately.

5.NBT.7

- Solve multiplication and division real- world problems involving decimals using model drawing and other problem- solving strategies.
- Explain the process used in solving a multiplication or division problem using decimals.

	● Solve multiplication (a whole number and a decimal) and division (a decimal by a whole number), using decimals up to the hundredths place. ● Round quotients to the nearest tenth or hundredth.

Standards Alignment
MISSOURI LEARNING STANDARDS **MP.1 Make sense of problems and persevere in solving them.** **MP.2 Reason abstractly and quantitatively.** **MP.3 Construct viable arguments and critique the reasoning of others.** **MP.4 Model with mathematics.** **MP.5 Use appropriate tools strategically.** **MP.6 Attend to precision.** **MP.7 Look for and make use of structure.** **MP.8 Look for and express regularity in repeated reasoning.** 5.OA.1: Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.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*. 5.OA.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.NBT.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 5.NBT.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. 5.NBT.4: Use place value understanding to round decimals to any place. 5.NBT.5: Fluently multiply multi-digit whole numbers using the standard algorithm.

5.NBT.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.

5.NBT.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.

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 3 - Algebra
Unit Title: Algebra Course: 5th Grade Mathematics Brief Summary of Unit: In this unit, students will use algebraic expressions to describe situations and solve real-world problems. Textbook Correlation: Chapter 5 - Algebra Time Frame: approximately 2.5 weeks

Transfer
Students will be able to independently use their learning of algebraic expressions to describe situations and solve real-world problems.

Meaning	
Essential Questions	Understandings
Students will consider…. **5.OA.1** ● Why are parentheses, brackets, and braces used? ● Why is there a specific order to solving the expression instead of always solving left to right? ● How does the placement of parentheses, brackets, or braces affect the result? ● When should a variable be used? ● Why is it important to make sure both sides of an equality are equal? ● What is the best way to simplify an algebraic expression? ● How are algebraic expressions and numeric expressions similar? Different? ● Why are addition and subtraction considered opposite operations? ● Why are multiplication and division considered opposite operations? **5.OA.2** ● What real-world situation would I use to demonstrate the expression? ● What verbal expression would correspond with the numerical expression?	*Students will understand that…* **5.OA.1** ● There is a specific order to solving expressions. ● Subtraction is the inverse operation of addition. ● Addition is the inverse operation of subtraction. ● Division is the inverse operation of multiplication. ● Multiplication is the inverse operation of division. **5.OA.2** ● A verbal expression corresponds with a numerical expression. ● An expression is a series of numbers and symbols (+, -, x, ÷) without an equals sign. ● An expression is a form of representing a number. ● A variable is a symbol that is used to represent an unknown quantity. ● Simplifying an algebraic expression makes the expression more readable. ● In order to keep equality, whatever operation is done to one side of the equation must also be done to the other side of the equation.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.OA.1** ● Numerical expression ● Algebraic expression ● Variable ● Evaluate ● Simplify ● Like terms ● Inequality ● Equation ● Solve ● True ● Order of Operations: Parentheses Brackets Braces Multiplication or Division (Left to Right) Addition or Subtraction (Left to Right)	*Students will be able to….* **5.OA.1** ● Evaluate expressions using order of operations. (For example, {10+[(3 – 1) + 7] } – (8 ÷ 1)) ● Explain the reasoning of how to solve expressions. **5.OA.2** ● Verbally describe expressions. ● Describe a real-world situation when interpreting the expression. ● Given a verbal or written description of a mathematical process, write the process in mathematical notation. The process should include at least 2 operations and the use of parenthesis. (For example, write an expression for “first add 8 and 7, then multiply by 3”.) ● Given a mathematical statement, verbally and in written form, describe the process. (For example, given 2 x (7 - 3), write a description of the process.) ● Interpret the numerical meaning of an expression without having to compute the answer. (For example, recognize that 4 x (3 + 8) is 4 times the size of (3 + 8). ● Recognize, write and evaluate simple algebraic expressions in one variable. ● Simplify algebraic expressions in one variable. ● Write and evaluate inequalities. ● Solve simple equations. ● Solve real-world problems using algebraic expressions using model drawing and other problem solving strategies.

Standards Alignment

MISSOURI LEARNING STANDARDS

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

5.OA.1: Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

5. OA.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.*

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 4 – Adding, Subtracting, Multiplying and Dividing Fractions and Mixed Numbers

Unit Title: Adding, Subtracting, Multiplying and Dividing Fractions and Mixed Numbers

Course: 5th Grade Mathematics

Brief Summary of Unit: In this unit, students will understand the relationships among fractions, mixed numbers, division expressions, and decimals. They apply this knowledge to add and subtract unlike fractions and mixed numbers; multiply and divide whole numbers, proper fractions, improper fractions, and mixed numbers in any combination; as well as solve real-world problems using fractions.

Textbook Correlation: Chapter 3 - Fractions and Mixed Numbers
Chapter 4 - Multiplying and Dividing Fractions and Mixed Numbers

Time Frame: approximately 6-7 weeks

Transfer

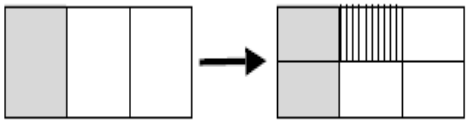
Students will be able to independently use their learning to apply the knowledge to solve problems involving fractions such as:

- following a recipe, doubling a recipe
- determining sale prices -half off, one-third off, etc.
- proportioning out items
- traveling
- measuring.

Meaning	
Essential Questions	Understandings
Students will consider… **5.NF.1** ● How do you create equivalent fractions? ● Why is a common denominator needed to add and subtract? ● How do you regroup in order to subtract fractions with unlike denominators? ● When adding and subtracting fractions, is it better to compute the operations using improper fractions or using mixed numbers? ● When should I leave an improper fraction as an improper fraction, and when should I change an improper fraction into a mixed number? **5.NF.2** ● How are basic benchmark fractions identified? ● What are the most efficient strategies for solving word problems with adding and subtracting fractions? **5.NF.3** ● Why do you have to change an improper fraction into a mixed number? ● How is a fraction a representation of division? ● When should I leave an improper fraction as an improper fraction, and when should I change an improper fraction into a mixed number? ● When adding and subtracting fractions, is it better to compute the operations using improper fractions or using mixed numbers? ● What is the best strategy to use to mentally compute sums and differences of fractions? ● What is the best strategy to use to mentally estimate sums and differences of fractions? ● Why should I worry about a fractional part in a real-world problem?	*Students will understand that…* **5.NF.1** ● A common denominator is needed to add or subtract fractions. ● You must change an improper fraction to a mixed number when representing situations with a number of whole objects and a portion of an object as well as communicating with others about real world situations. ● At times, you will need to regroup when subtracting fractions. **5.NF.2** ● Benchmark Fractions allow us to estimate addition and subtraction of fractions. ● Real-world problems often involve fractions and fraction operations with unlike denominators. **5.NF.3** ● A fraction is a representation of division. ● Fractional parts have real-world meaning. ● Sometimes it is best to use a whole-number and its fractional part; sometimes it is best to truncate the fractional part; and sometimes it is best to round up to the next nearest whole number.

5.NF.4.a ● When are the products of fractions smaller than the fractions within the problem? Ex: ½ x ¼ = 1/8 ● When are the products of fractions larger than the fractions within the problem? Ex: 6/2 x 10/2 = 60/4 **5.NF.5** ● How do numbers change when you multiply by fractions? **5.NF.6** ● Which strategy is the most effective way to solve a problem? **5.NF.7** ● How are multiplication and division related? ● How is division with fractions similar to division with whole numbers? ● How is division with fractions different than division with whole numbers?	**5.NF.4.a** ● Multiplication of a fraction by a whole number could be represented as repeated addition of a unit fraction (e.g., 2 x (1/4) = 1/4 + 1/4). ● The product (a/b) x q represents a part of a partition q (a x b number of parts) divided into b equal parts. **5.NF.5** ● Multiplying by a number greater than 1 results in a product that is greater than the original number. ● Multiplying by a number less than one results in a product that is less than the original number. ● Finding an equivalent fraction is the same as multiplying a number by one. **5.NF.6** ● There are multiple ways to solve a problem, with one strategy usually being more efficient. ● There is a relationship between multiplication and division. **5.NF.7** ● There is a reciprocal relationship between multiplication and division. ● Dividing by a number less than one results in a quotient that is larger than the original number. ● Dividing by a number more than one results in a quotient that is smaller than the original number.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.NF.1** ● Equivalent Fractions ● Common Denominators	*Students will be able to….* **5.NF.1** ● Add and Subtract fractions with like and unlike denominators, mixed numbers, with

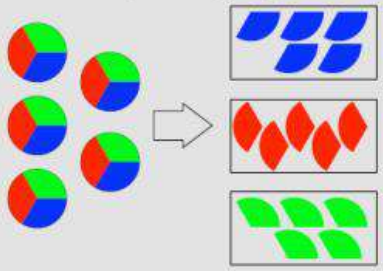
• Improper Fractions • Mixed Numbers	and without regrouping, with unlike denominators. Examples: $\frac{2}{5}+\frac{7}{8}=\frac{16}{40}+\frac{35}{40}=\frac{51}{40}$ $3\frac{1}{4}-\frac{1}{6}=3\frac{3}{12}-\frac{2}{12}=3\frac{1}{12}$ • Create equivalent fractions. • Express fractions, division expressions, and mixed numbers as decimals. • Simplify fractions. • Convert improper fractions to mixed numbers. • Convert mixed numbers to improper fractions.
	Example: 1/3 + 1/6  1/3 is the same as 2/6

5.NF.2
• Basics of Benchmark Fractions (0, ½, 1)
	5.NF.2
	• Use mental math to assess the reasonableness of a solution to a problem that involves fractions.
	• Estimate the sum of two mixed numbers.
	• Estimate the difference between two mixed numbers.
	• Use benchmark fractions to estimate a sum or difference.
	Example:
	Estimate the sum of 11/12, ⅔, ⅙
	(11/12 is close to 1, 2/3 is close to ½, and ⅙ is close to 0, so 1 + ½ + 0 = 1 ½. Estimated sum is 1 ½).
	• Construct an explanation why a particular solution to a problem is reasonable.
	• Solve word problems involving addition and subtraction of fractions and mixed numbers.
	  ○ using bar models
	  ○ equations

5.NF.3

- Solve word problems involving division of whole numbers that lead to a fractional answer.
- Connect fractions and division.
- Students should also create story contexts to represent problems involving division of whole numbers.

How to share 5 objects equally among 3 shares:
$5 \div 3 = 5 \times \frac{1}{3} = \frac{5}{3}$



If you divide 5 objects equally among 3 shares, each of the 5 objects should contribute $\frac{1}{3}$ of itself to each share. Thus each share consists of 5 pieces, each of which is $\frac{1}{3}$ of an object, and so each share is $5 \times \frac{1}{3} = \frac{5}{3}$ of an object.

5.NF.4

- Represent multiplication of fractions in a variety of ways - see examples below.
  a) 3 x ½ = ½ + ½ + ½
  b) ⅝ x ½ = $\frac{5\ x\ 1}{8\ x\ 2}$
  c) see example at the end of the document
- Multiply fractions by proper and improper fractions and whole numbers by fractions.
- Multiply mixed numbers.
- Represent the product of two fractions or a fraction and a whole number as rectangular area.
- Given a division sentence that involves fractions (a whole number divided by a unit fraction or a unit fraction divided by a whole number), construct a story context.
- Use a visual model (for instance, bar model) to verify the quotient of a division problem that involves a whole number divided by a unit fraction or a unit fraction divided by a whole number.

	5.NF.5 ● Multiply fractions and mixed numbers (See 5.NF.5 example at the end of the document.) ● Construct a visual representation of explaining why multiplication can be interpreted as scaling or resizing. ● Estimate the reasonableness of a product by considering the scaling effect of multiplying by a fraction. (For example, recognizing that the product of 5 x ½ should be less than five because it is being multiplied by a number that is less than 1.) **5.NF.6** ● Prove the validity of their problem solving strategy. (see example at the end of the document) ● Solve real-world problems involving the multiplication of fractions and mixed numbers using visual models (bar modeling), equations and other problem solving strategies.
5.NF.7 ● reciprocal	**5.NF.7** ● Divide a whole number by a unit fraction (for example, 3 ÷ ¼) ● Divide a unit fraction by a whole number. (for example, ⅕ ÷7) ● Construct a story context for a given multiplication sentence that includes fractions and mixed numbers. ● Use a visual model to be able to explain the quotient of a fraction and a fraction. ● Solve real world problems involving the division of fractions using model drawing and other problem solving strategies. **Example:** How many 1/3-cup servings are in 2 cups of raisins? **Student:** I know that there are three 1/3 cup servings in 1 cup of raisins. Therefore, there are 6 servings in 2 cups of raisins. I can also show this since 2 divided by 1/3 = 2 x 3 = 6 servings of raisins. ● Construct an explanation for why dividing is the same as multiplying by the reciprocal. ● Use a visual model to be able to explain the quotient of a fraction and a fraction.

Standards Alignment

MISSOURI LEARNING STANDARDS

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

5.NF.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.

5.NF.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.

5.NF.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?*

5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)

5.NF.5: Interpret multiplication as scaling (resizing), by:

a. Comparing the size of a product to the size of one size of the other factor, without performing the indicated multiplication.
b. 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 × a)/(n × b) to the effect of multiplying a/b by 1.

5.NF.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.

5.NF.7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

a. 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 to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*

b. 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.

c. 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 ½ lb. of chocolate equally? How many 1/3-cup servings are 2 cups of raisins?*

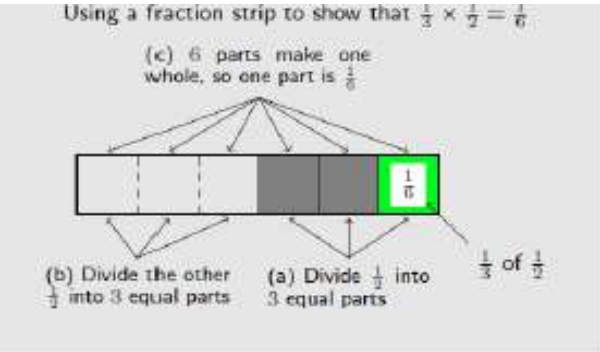
Show Me-Standards

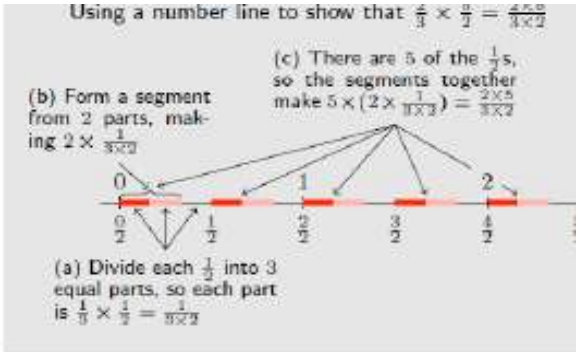
Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 5

Key Skill

5.NF.4 - Example c.)

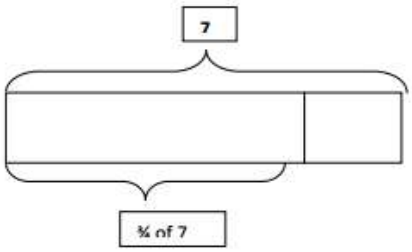




5.NF.5 - Multiply Fractions and Mixed Numbers

Example:

$\frac{3}{4} \times 7$ is less than 7 because 7 is multiplied by a factor less than 1 so the product must be less than 7.

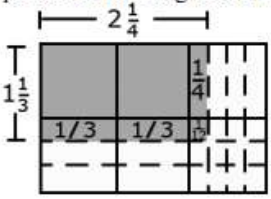


5.NF.6 - prove the validity of their problem solving strategy.

Example:

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?

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 $2\frac{3}{12} + \frac{8}{12} + \frac{1}{12} = 2\frac{12}{12} = 3$

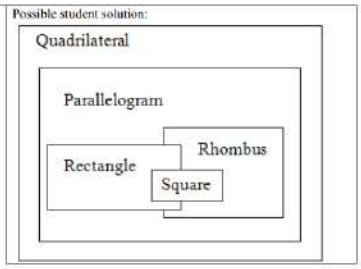
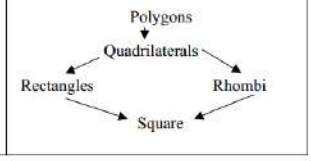
Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 5 - Triangles and Angles
Unit Title: Triangles and Angles Course: 5th Grade Mathematics Brief Summary of Unit: In this unit, students will use base and height measurements to find the area of a triangle. They will also find unknown angle measurements by using several angle properties. Textbook Correlation: Chapter 6 - Area of Triangles Chapter 12 - Angles Time Frame: approximately 3 weeks

Transfer
Students will be able to independently use their learning to use spatial visualization with triangles and measurement of angles in relation to their profession (i.e. artist and construction worker).

Meaning	
Essential Questions	Understandings
Students will consider… **5.NF.4.b** ● How do you find the area of a quadrilateral and a triangle? ● How do you find the area using fractional side lengths? **5.G.3** ● What makes each shape unique? ● What are similarities and differences among shapes? ● What is the best way to categorize a particular shape? **5.G.4** ● What are ways to classify triangles? ● How are angles classified? ● How are angles measured?	*Students will understand that…* **5.NF.4.b** ● A square unit could have fractional lengths. As long as the lengths of a square unit are the same, it is still considered a square unit. (For example, a square with lengths ¼ x ¼, is still considered a unit square.) **5.G.3** ● All shapes are identified by their specific attributes. ● Any subcategory of shape must also belong to the more general category a shape belongs. **5.G.4** ● A visual representation of a shape hierarchy is an efficient way to describe the relationships among shapes with similar attributes. ● The sum of angle measures on a line is 180 degrees. ● The sum of angle measures at a point is 360 degrees. ● A protractor is used to measure an angle. ● Relationships between shapes can be used to solve problems and describe the real-world.

Acquisition	
Key Knowledge	Key Skills
Students will know…	*Students will be able to….*
	5.NF.4.b ● Find the area of a rectangle with fractional side lengths. ● Apply the property that the sum of angle measures on a line is 180. ● Apply the property that the sum of angles around a point is 360. ● Apply the property that vertical angles have equal measure. ● Identify the base of a triangle given the height. ● Identify the height of a triangle given the base. ● Find the area of a triangle given the base and the height.
5.G.3 ● Attribute ● Feature ● triangle, equilateral triangle, isosceles triangle, scalene triangle, equiangular triangle ● angles on a line ● supplementary angles ● angles at a point ● vertical angles ● intersecting lines ● angle ● vertex ● side ● base ● height ● perpendicular	**5.G.3** ● Discuss/Identify properties of shapes and provide reasoning.
5.G.4 ● Hierarchy	**5.G.4** ● Given a shape, tell what other names of shapes could be used to classify the shape. ● Construct a visual representation (chart, diagram, etc.) that represents the relationships between different kinds of quadrilaterals and different types of triangles.

	• Create a Hierarchy diagram using the following terms quadrilateral – a four-sided polygon. parallelogram – a quadrilateral with two pairs of parallel and congruent sides. rectangle – a quadrilateral with two pairs of congruent, parallel sides and four right angles. rhombus – a parallelogram with all four sides equal in length. square – a parallelogram with four congruent sides and four right angles. Possible student solution:  Example: Create a Hierarchy Diagram using the following terms: polygons – a closed plane figure formed from line segments that meet only at their endpoints. quadrilaterals - a four-sided polygon. rectangles - a quadrilateral with two pairs of congruent parallel sides and four right angles. rhombi – a parallelogram with all four sides equal in length. square – a parallelogram with four congruent sides and four right angles. Possible student solution: 

Standards Alignment

MISSOURI LEARNING STANDARDS

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.3 Construct viable arguments and critique the reasoning of others.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision.

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.

5.NF.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

b. 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.G.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.

5.G.4: Classify two-dimensional figures in a hierarchy based on properties.

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 2, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 6 - Geometric Shapes
Unit Title: Geometric Shapes Course: 5th Grade Mathematics Brief Summary of Unit: In this unit students will understand that triangles and four-sided figures have their own special properties and will identify and classify solid figures by the number of faces, edges, and vertices. Textbook Correlation: Chapter 13 - Properties of Triangles and Four-sided Figures Chapter 14 - Three-dimensional Shapes Time Frame: approximately 4.5 weeks

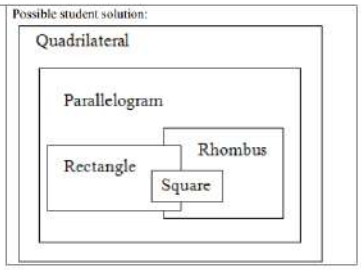
Transfer
Students will be able to independently use their learning to apply the use of spatial visualization to real- life such as loading the dishwasher, organizing the pantry, and packing a suitcase.

Meaning	
Essential Questions	Understandings
Students will consider… **5.G.3** ● What makes each shape unique? ● What differentiates a 2-D shape and a 3-D shape? ● What are the properties of a 3-D shape? ● What are similarities and differences among shapes? ● What is the best way to categorize a particular shape? **5.G.4** ● What are ways to classify triangles? ● How are parallelograms classified? ● How are quadrilaterals classified?	*Students will understand that…* **5.G.3** ● All shapes are identified by their specific attributes. ● Any subcategory of shape must also belong to the more general category of which a shape belongs. ● Solid figures can be identified and classified by the number of faces, edges, and vertices. ● The three interior angles of a triangle equal 180 degrees. ● A net is a plane figure that can be folded to make a solid figure. **5.G.4** ● Different shapes have different attributes. ● A visual representation of a shape hierarchy is an efficient way to describe the relationships among shapes with similar attributes. ● Relationships between shapes can be used to solve problems and describe the real-world.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.G.3** ● Attribute ● Feature ● Square, rectangle, rhombus, quadrilateral, trapezoid, parallelogram, triangle, equilateral triangle, isosceles triangle, scalene triangle, equiangular triangle, acute triangle, obtuse triangle, face, edge, vertex, angle sum in a triangle property, base, prism, net, rectangular prism, triangular prism, pyramid, square pyramid, triangular pyramid, cylinders, sphere, cone **5.G.4** ● Hierarchy	*Students will be able to….* **5.G.3** ● Discuss/identify properties of shapes and reasoning. ● Construct an argument why a particular shape belongs in more than one category. (For example, explain why a square is also a rectangle, parallelogram, rhombus, and quadrilateral.) **5.G.4** ● Given a shape, tell what other names of shapes could be used to classify the shape. ● Classify triangles based on the length of their sides and the measure of their angles. ● Apply the property that the sum of the measures of the angles in a triangle is 180. ● Use the property that the sum of the lengths of two sides of a triangle is always greater than the length of the third side to solve problems. ● Apply the properties of parallelograms, trapezoids and rhombi to solve problems. ● Identify and classify prisms and pyramids. ● Identify the solid figure that can be formed from a net. ● Identify and classify cylinders, cones, and spheres. ● Construct a visual representation (chart, diagram, etc.) that represents the relationships between different kinds of quadrilaterals and different types of triangles. ● Create a Hierarchy diagram using the following terms:

quadrilateral – a four-sided polygon.
parallelogram – a quadrilateral with two pairs of parallel and congruent sides.
rectangle – a quadrilateral with two pairs of congruent, parallel sides and four right angles.
rhombus – a parallelogram with all four sides equal in length.
square – a parallelogram with four congruent sides and four right angles.

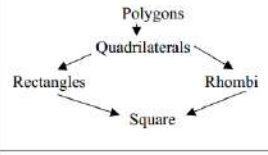
Possible student solution:



Example:
Create a Hierarchy Diagram using the following terms:

polygons – a closed plane figure formed from line segments that meet only at their endpoints.
quadrilaterals - a four-sided polygon.
rectangles - a quadrilateral with two pairs of congruent parallel sides and four right angles.
rhombi – a parallelogram with all four sides equal in length.
square – a parallelogram with four congruent sides and four right angles.

Possible student solution:



Standards Alignment

MISSOURI LEARNING STANDARDS

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

5.G.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.

5.G.4: Classify two-dimensional figures in a hierarchy based on properties.

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 2, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 7 - Surface Area and Volume
Unit Title: Surface Area and Volume Course: 5th Grade Mathematics Brief Summary of Unit: In this unit the students will find the surface area of prisms and the volumes of rectangular prisms and relate these volumes to liquid measures. Textbook Correlation: Chapter 15 - Surface Area and Volume Time Frame: approximately 3 weeks

Transfer
Students will be able to independently use their learning of surface area and volume to describe situations and solve real-world problems such as choosing appropriate containers, packing a trunk, and organizing the refrigerator.

Meaning	
Essential Questions	Understandings
Students will consider… **5.MD.1** ● How do I know when to multiply or divide to convert a measurement? ● How do I know which conversion to use? ● Which unit should I convert? Why?	*Students will understand that…* **5.MD.1** ● Some units better describe a real-world situation than others. (For instance, using cm is a good way to measure smaller objects, but not larger units.) ● When solving problems involving measurements with units, the units need to be the same.
5.MD.3 ● How does area compare to volume? ● What is the relationship between the number of "unit cubes" packed into a solid figure to the total volume of a cube?	**5.MD.3** ● A larger figure has more volume because it takes up more space; A 1-unit by 1-unit by 1-unit cube is the standard unit for measuring volume; A rectangular prism can be "packed", without gaps or overlaps, using unit cubes. ● One milliliter of liquid volume is equal to one cubic cm of solid volume. ● Volume is used to measure the amount of space an object takes up. This could be a solid or a liquid measurement.
5.MD.4 ● How can unit cubes fit into a shape without any gaps or overlaps? ● What is the best way to measure volume?	**5.MD.4** ● The number of non-overlapping cubes "packed" into a shape gives the measured volume.
5.MD.5 ● How do you find the volume of a rectangular prism? ● How do you find the volume of a solid that is made up of more than one rectangular prism? ● What is the best method for finding volume of "this" object?	**5.MD.5** ● Multiplying B (B = area of the base) by the height or l x w x h, directly relates to the formula for finding the volume of a rectangular prism. ● When combining rectangular prisms, you add the volume of each rectangular prism to find the total volume. ● The volume of a rectangular prism is equivalent to finding the product of the edge lengths.
Surface Area ● What is surface area? ● How is surface area related to the net?	**Surface Area** ● The surface area of an object is the sum of the areas of all its faces, or surfaces.

Acquisition	
Key Knowledge	Key Skills
Students will know… **5.MD.1** ● Measurement has connections to fractions and decimals. ● How the base-ten system supports conversions within the metric system. **5.MD.3** ● attribute, volume, unit cube, gap, overlap, cubic units, unit cube, surface area, right triangle **5.MD.4** ● Cubic units ● "Packing" ● Cubic cm, cubic in., cubic ft. **5.MD.5** ● Volume of Rectangular Prisms Formulas: V =l x w x h and V = B x h	*Students will be able to….* **5.MD.1** ● Convert measurements within the same system of measurement (both metric and standard measurement systems) and in the context of multi-step, real-world problems. ● Convert measurements in relation to fractions and decimals. ● Solve multi-step problems involving conversions. **5.MD.3** ● Compare the volume of solid figures based on the amount of space (size) the object takes up. ● Relate the 1-unit by 1-unit by 1-unit cube to being represented by an exponent of 3. ● Build solids using unit cubes. ● Determine the number of unit cubes in an irregular solid. ● Draw a cube and a rectangular prism on dot paper. ● Complete a partially drawn cube and rectangular prism on dot paper. **5.MD.4** ● Differentiate between "filling" and "packing" to find the volume. ● Count the cubes to find the volume of solid figures and record the volume in cubic units. **5.MD.5** ● Develop a strategy for determining the volume of rectangular prisms. (e.g. use formula, count cubic units, etc.) ● Find the volume of rectangular prisms. (LxWxH) ● Recognize volume as additive. For example, students might design a science station for the ocean floor that is composed of several rooms that are right rectangular

	prisms and that meet a set criterion specifying the total volume of the station. ● Find the volume of an irregular object by decomposing the object into smaller rectangular prisms and cubes. ● Find the surface area of a prism by adding the area of each face. ● Find the volume of a solid constructed from unit cubes. ● Compare the volumes of cubes, rectangular prisms and other objects. ● Find the capacity of a rectangular container. ● Solve word problems involving volume of rectangular prisms and liquids.

Standards Alignment

MISSOURI LEARNING STANDARDS

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

5.MD.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.

5.MD.3: Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
a. 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.
b. 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.

5.MD.4: Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

5.MD.5: Relate volume to the operations of multiplication and addition and solve real world and

mathematical problems involving volume.

a. 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.
b. 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.
c. 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.

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

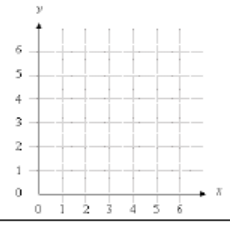
Mathematics: 1, 2, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit 8 - Graphs and Probability
Unit Title: Graphs and Probability Course: 5th Grade Mathematics Brief Summary of Unit: In this unit, students will understand that displaying data in a graph highlights some features of the data, and that probability measures the likelihood of an event's occurrence. Textbook Correlation: Chapter 11 - Graphs and Probability Time Frame: approximately 3 weeks

Transfer
Students will be able to independently use their learning to read and interpret charts and graphs to gather information concerning their daily life.

Meaning	
Essential Questions	Understandings
Students will consider… **5.G.1** ● How are locations identified? ● What is the best way to plot a point? ● What are the benefits of using a coordinate plane? **5.G.2** ● How do you measure distances between locations in a coordinate system? ● What are some real-world situations that can be modeled using a coordinate system? ● What is the best kind of graph that can be used to display "this" data set? **5.MD.2** ● How can I analyze the data set (mean, range, etc.)? ● What can I say about this line plot? ● Why is a line plot the best way to represent this data set? **Probability** ● What is the likelihood of a particular event happening? ● How many different combinations can be made given different choices?	*Students will understand that…* **5.G.1** ● All points in a plane have a specific location. ● A coordinate plane is a pair of 2 number lines that are perpendicular to each other that can uniquely identify a point in a plane. ● Properties of 2-dimensional shapes can be discovered using a coordinate system. **5.G.2** ● Real-world problems can be modeled using a coordinate plane. ● A scatter plot is used to graph data points that have two quantitative characteristics. ● There is a measured distance between points on a plane. **5.MD.2** ● Various operations are used with fractions to analyze their line plot data. ● A line plot is an efficient way to describe the characteristics of a data set. **Probability** ● Probability measures the likelihood of an event's occurrence. ● Experimental probability does not always match the theoretical probability. The more times you conduct an experiment, the more likely it will match the theoretical probability. ● A tree diagram is an efficient way to list out all the possible outcomes of an event.

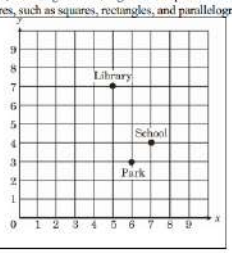
Acquisition	
Key Knowledge	Key Skills
Students will know… **5.G.1** ● All four Quadrants (locally assessed) - Quadrant 1, Quadrant 2, Quadrant 3, Quadrant 4 ● Coordinate System ● Ordered Pairs ● Origin ● Know x-axis, y-axis, positive numbers, negative numbers	*Students will be able to….* **5.G.1** ● Given an ordered pair that consists of either positive or negative numbers, plot the point on a coordinate plane. ● Given points plotted on a coordinate plane (in any of the 4 quadrants), state the ordered pair that represents the point. ● Given a set of ordered pairs that form a 2-dimensional shape, identify the 2-dimensional shape. ● Solve problems using coordinate geometry. (See example) ● Plot and locate the points on the grid. Example: Connect these points in order on the coordinate grid below: (2, 2) (2, 4) (2, 6) (2, 8) (4, 5) (6, 8) (6, 6) (6, 4) and (6, 2). Coordinate Grid What letter is formed on the grid? *Solution: "M" is formed.*  Example: Plot these points on a coordinate grid. Point A: (2,6) Point B: (4,6) Point C: (6,3) Point D: (2,3) Connect the points in order. Make sure to connect Point D back to Point A. 1. What geometric figure is formed? What attributes did you use to identify it? 2. What line segments in this figure are parallel? 3. What line segments in this figure are perpendicular? *solutions: trapezoid, line segments AB and DC are parallel, segments AD and DC are perpendicular* Example: Emanuel draws a line segment from (1, 3) to (8, 10). He then draws a line segment from (0, 2) to (7, 9). If he wants to draw another line segment that is parallel to those two segments what points will he use? **5.G.2** ● Solve problems involving distance on a coordinate plane. ● Graph points on a coordinate plane that

represent data points that have two numerical characteristics on a coordinate plane. (Construct scatterplots.)

- Locate points on the coordinate plane.

This standard references real-world and mathematical problems, including the traveling from one point to another and identifying the coordinates of missing points in geometric figures, such as squares, rectangles, and parallelograms.

Example:
Using the coordinate grid, which ordered pair represents the location of the School?
Explain a possible path from the school to the library.



Example:
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?

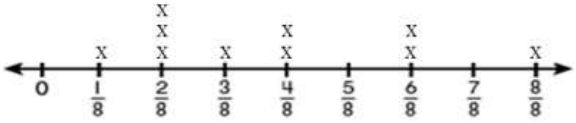
5.MD.2

- line plot
- range
- mean
- median
- mode
- spread
- double bar graph
- key
- combination
- tree diagram
- organized list
- favorable outcome
- theoretical probability
- experimental probability

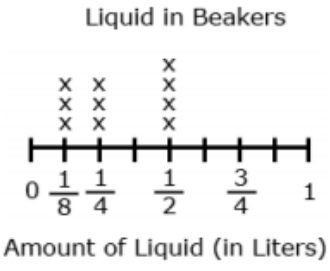
5.MD.2

- Construct a line plot to display a data set of measurements up to ⅛ of a unit.
- Apply all operations with fractions to solve problems based on the line plot.
- Make and interpret a double bar graph.

Example #1: If you put all the objects together end to end what would be the total length of all the objects?



Example #2: If the liquid is redistributed equally, how much liquid would each beaker have? (This amount is the mean.)



- Plot real-world data that has one quantitative or one qualitative characteristic on a line plot.
- Given a line plot, determine the range, mean, median, and mode of the set of data.
- Solve problems involving the data displayed on a line plot. (For example, how much liquid

	would be in each category, if all categories had the same amount?) ○ List and count all possible combinations. ○ Draw a tree diagram to show all possible combinations. ○ Use multiplication to find the number of combinations. ○ Find the experimental probability of an outcome. ○ Compare the results of an experiment with the theoretical probability. ● Use various operations with fractions to analyze line plot data.

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

Show Me-Standards

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 3, 5