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# 5th Grade Math Curriculum Revised August 2024

# Big Ideas Math

## Chapter 1: Place Value Concepts

**Standards**

5.NBT.A.1, 5.NBT.A.2, 5.NBT.A.3, 5.NBT.A.4, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.A.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 of what it represents in the place to its left.

**5.NBT.A.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.A.3** - Read, write, and compare decimals to thousandths.

**5.NBT.A.3a**. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., .

**5.NBT.A.3b**. 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.A.4** - Use place value understanding to round decimals to any place.

**Objectives:**

- Find a number that is 10 times as much as a given number.
- Find a number that is 1/10 of a given number.
- Describe how positions in a place value chart are related.
- Identify the value of a digit in a multi-digit number.
- Write multi-digit numbers in different forms.
- Compare the values of two identical digits in a multi-digit number. Use exponents to show powers of 10.
- Find the values of expressions with powers of 10. Write a decimal to the thousandths place as a fraction. Write a fraction involving thousandths as a decimal.
- Identify the value of a digit in a decimal.
- Write decimals in different forms.
- Compare the values of two identical digits in a decimal. Choose a strategy to compare two decimals
- Use the symbols <, >, and = to compare two decimals. Compare and order decimals.
- Explain which digit I use to round and why.
- Round a decimal to any place.

**Extend Activities:**

1. Draw and Write

**Materials per student**: Draw and Write Number Cards*, whiteboards, and markers

Have students put their Draw and Write Number Cards into a pile. They will draw one card at a time and then race to see who can write the number on the card as a whole number multiplied by a power of 10 on their whiteboard. The first person to write it correctly gets a point. Students can play until all cards are used.

2. Spin and Tell

**Materials per student**: Standard Form Spinners*, whiteboards, and markers

Partner A will use Spinner 1 and write the number in expanded form on a whiteboard. The other partner will look at the whiteboard and then write the number in standard form on a sheet of paper and read it out loud. Partner A checks to see if the number matches the number on the spinner. Partners then change roles. Partner B will use Spinner 2. If students spin a number they have already written, then have them spin again.

**Gifted and Talented:**

1. Roll and Round

**Materials per pair:** Roll and Round Board*, dice, counters, whiteboards and markers

Have students take turns rolling three dice at a time. Students will then place the rolled dice in any order on top of the whiteboard and write a decimal point in front of the first number. They will then round the number they have created to the nearest hundredth and place a counter on top of that number on the game board. Students will use different colored counters so they can keep track of how many numbers they each cover. Play until the whole board is covered or until time is up. The partner with the most counters on the board wins.

**Note:** Decide ahead of time if "bumping" counters off the board is OK.

## Chapter 2: Numerical Expressions

**STANDARDS**

5.OA.A.1, 5.OA.A.2, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

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

**5.OA.A.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 . Recognize that is three times as large as without having to calculate the indicated sum or product.

**Objectives:**

- Identify number properties in equations.
- Use number properties to write equivalent expressions.
- Identify the operations in a numerical expression.
- Determine the order to perform the operations in a numerical expression.
- Evaluate a numerical expression.
- Write a verbal statement as a numerical expression.
- Use parentheses in an expression appropriately.

- Interpret an expression.
- Identify different types of grouping symbols.
- Evaluate an expression with multiple pairs of grouping symbols.

**Extend Activities:**

1. Number Properties Foldable

**Materials:** Number Properties Foldable*

Provide each student with a Number Properties Foldable and start by folding it in half, similar to how a book would be created. Under each property fold, students should provide a definition (written in their own words) as well as an example that shows each property. Encourage students to use different examples than in the book. Students can also use craft supplies, such as stickers, to represent each property on the foldable.

2. Order of Operations Puzzle

**Materials:** Order of Operations Puzzle Cards*, scissors

Cut out each puzzle piece and place it face up on a desk. Students will need to evaluate each expression and match that side to the side with the correct answer. Students should show their work to ensure they are performing the order of operations correctly. When completed, the puzzle should create a 4 by 4 square.

**Gifted and Talented:**

1. Mnemonic Order of Operations

**Materials:** colored pencils

Allow time for students to create their own mnemonic device for remembering the order in which they should perform the operations when evaluating an expression. Have students also provide an illustration. Encourage students to be creative when creating their mnemonic device.

**Note:** Ensure that students are aware that when performing multiplication and division as well as addition and subtraction, students must follow operations from left to right.

**Example:** Penguins Enjoy Meeting During Avalanche Snowstorms

## Chapter 3: Add and Subtract Decimals

### STANDARDS

5.NBT.A.4, 5.NBT.B.7, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.A.4 -** Use place value understanding to round decimals to any place.

**5.NBT.B.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.

### Objectives:

- Use rounding to estimate a sum or difference.
- Use compatible numbers to estimate a sum or difference.
- Use base ten blocks to add or subtract decimals.
- Make quick sketches to add or subtract decimals.
- Add like place values to add decimals.
- Add decimals, regrouping when needed.
- Estimate a sum to check whether my answer is reasonable.
- Subtract like place values to subtract decimals.
- Subtract decimals, regrouping when needed.
- Estimate a difference or use addition to check my answer.
- Add and subtract like place values.
- Evaluate expressions with three decimals.
- Estimate the value of an expression.
- Use addition properties to add decimals.
- Use compensation to add or subtract decimals.
- Use place value to add or subtract decimals.
- Understand a problem.
- Make a plan to solve.
- Solve a problem.

**Extend Activities:**

1. Decimal Boss: Addition

**Materials per pair:** Decimal Boss Addition Cards*

Have students shuffle their Decimal Boss Addition Cards and then divide the cards equally between both players. Players will each flip a decimal boss addition card from their pile. They will solve the equation and compare their answers. The player with the greater number takes both cards. The player with the most cards at the end of the round wins.

2. Race to Subtract Decimals

**Materials:** 10-sided dice, Race to Subtract Decimals*

Have students work with a partner. Each student rolls the die four times. They write the numbers on the blank lines on their Race to Subtract Decimal Sheet. Then students will solve the equations and write their answers on both the answer line and in the box for the subtrahend in the next problem following the arrow. Students will continue this process until all equations are written and solved. The person with the greatest answer for the last equation wins. Play another round where the person who has the lesser answer at the end wins.

**Note:** Have students place their copy of Race to Subtract Decimals in a plastic cover and use a dry erase marker to write so they can play multiple times.

**Gifted and Talented:**

1. Roll to Make or Spend a Dollar

**Materials per pair:** die, Roll to Make or Spend a Dollar*

Have students take turns rolling a die and writing the value of the corresponding coin from the Roll to Make or Spend a Dollar Sheet. For the second roll, students will write an addition equation that adds the values together. They will continue rolling, writing an addition equation, and adding the value rolled to the previous total. The first person to get to a total of 100 cents wins. On the second round, tell students they will start out with $1.00. They will then roll to subtract the amount rolled from $1.00. Students will record their equations on paper. The first person to get to 0 wins.

**Note:** Decide ahead of time if students can go past 0 when rolling or if they have to roll the amount needed to get to 0 precisely.

## Chapter 4: Multiply Whole Numbers

### STANDARDS

5.NBT.A.2, 5.NBT.B.5, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.A.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.A.5** With accuracy and efficiency, multiply multi-digit whole numbers using the standard algorithm.

### Objectives:

- Explain how to multiply a number by a power of 10.
- Explain how to find a product involving multiples of 10.
- Use rounding to estimate a product.
- Use compatible numbers to estimate a product.
- Explain whether an estimate is an overestimate or an underestimate.
- Multiply to find partial products.
- Show how to regroup when needed.
- Add partial products to find a product.
- Multiply to find partial products.
- Show how to regroup when needed.
- Add partial products to find a product.
- Multiply to find partial products.
- Show how to regroup when needed.
- Add partial products to find a product.

### Extend Activities:

1. Flip and Multiply

**Materials per pair:** deck of cards

Shuffle and place the cards (ace through 9) in the middle of partners that are facing each other. Each partner will flip over three cards to create a three-digit number and place them face up in the middle. Players will then multiply the equation as they each see it. For example, one partner might see the equation as 463×971; however, the partner across from them will see the equation

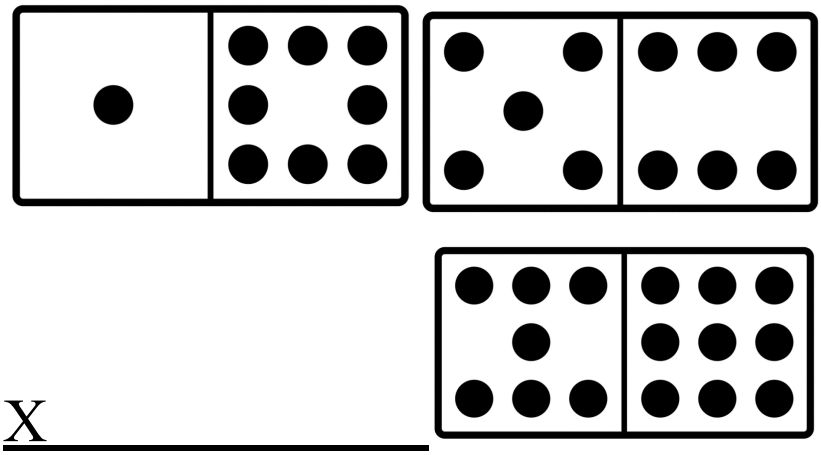
"reversed" as 179×364. Once solved, the partner with the larger product will keep all six cards. Repeat by flipping over three more cards each and solving to find the product.

2. Domino Duo

**Materials:** dominoes

Provide students with dominoes and place them face down on a desk. Students will choose three dominoes and use each side's dots as a digit. Two dominoes will become a four-digit number and will be multiplied by one domino, which will become a two-digit number. Students will record the multiplication equation and solve to find the product. Repeat by flipping over three more dominoes, arranging, and multiplying to find the product.

**Note**: The dominoes below represent the multiplication equation of 1,856×79.




**Gifted and Talented:**

1. Paint Swatch Patterns

**Materials:** dice, paint swatches

Provide each student with a colored paint swatch. Each colored section will have a multiplication equation where a two-digit number will be multiplied by a different power of 10. The top section will start at 101 and continue down to 105. Students will roll two dice to

create the two-digit number, which will then be multiplied by the power of 10 indicated on each section. A new two-digit number will be rolled for each section.

$63\ x\ 10^{1} = 630$

$24\ x\ 10^{2} = 2,400$

$12\ x\ 10^{3} = 12,000$

$53\ x\ 10^{4} = 530,000$

$43\ x\ 10^{5} = 4,300,000$

## Chapter 5: Multiply Decimals

**STANDARDS**

5.NBT.A.2, 5.NBT.A.4, 5.NBT.B.7, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.A.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.A.4 -** Use place value understanding to round decimals to any place.

**5.NBT.B.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.

**Objectives:**

- Explain how to multiply a decimal by a power of 10.
- Explain patterns in the placement of the decimal point when multiplying a decimal by a power of 10.
- Use rounding to estimate a product.
- Use compatible numbers to estimate a product.
- Explain different ways to estimate a product.

- Use a model to represent a decimal.
- Explain the relationship between addition and multiplication.
- Use a model to find the product of a decimal and a whole number.
- Use place value to multiply.
- Explain how to place the decimal point in a product.
- Use a model to represent a decimal.
- Use a model to multiply decimals.
- Write the partial products for a multiplication problem.
- Add the partial products to find a product.
- Use estimation to place the decimal point in a product. Use properties to multiply decimals.
- Explain the strategy I used to multiply.
- Multiply whole numbers.
- Determine the number of decimal places in a product. Find a product.
- Understand a problem.
- Make a plan to solve.
- Solve a problem.

**Extend Activities:**

1. Decimal Catcher

**Materials per pair**: Decimal Catcher*, scissors

Students will cut the Decimal Catcher on the solid lines and fold on the dotted lines. Partners will take turns using the Decimal Catcher to hold and maneuver while the other partner chooses a color first and then a decimal expression to solve. Both partners write down the expression that is chosen and solve before lifting up the fold and seeing the answer. Be sure students record their expressions and solve them on a separate sheet of paper.

**Note:** Provide more paper so that students can create their own Decimal Catchers with different expressions.

2. Dice Decimal Products

**Materials:** dice

Each student will start by rolling four dice and using the digits rolled to create two numbers that each have a ones digit and a tenths digit. Then, students will multiply the two numbers together and keep track of their products. Repeat five more times, each time recording the product. Once completed, each student will find the sum of all six products. The player with the lesser number wins!

**Gifted and Talented:**

1. How To Multiply Decimals Guide

**Materials:** paper, colored pencils

Have students create a "How to Guide" on multiplying decimals using the strategies they learned in this chapter. Students should provide at least one example equation for each of the strategies: use a model, partial products, place value, and properties of multiplication. Students can use craft supplies to create models and decorate their guides.

**Note:** Have students make their guides on colorful paper and fold as if it were a brochure.

## Chapter 6: Divide Whole Numbers

**STANDARDS**

5.NBT.B.6, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.B.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.

**Objectives:**

- Explain how to use an area model to divide.
- Write a related multiplication equation for a division problem.
- Use multiplication to solve a division problem.
- Divide a multiple of ten, one hundred, or one thousand by a one-digit number.
- Divide a multiple of ten, one hundred, or one thousand by a multiple of ten.
- Explain how to use place value and division facts to divide tens, hundreds, or thousands.
- Use division facts and compatible numbers to estimate a quotient.
- Find two estimates that a quotient is between.
- Use place value to divide.
- Show how to regroup when necessary.
- Find a quotient and a remainder.
- Explain how to use an area model to divide.
- Write partial quotients for a division problem.
- Add the partial quotients to find a quotient.

- Use partial quotients to divide.
- Find a remainder.
- Use estimation to place the first digit in a quotient.
- Use place value to divide.
- Use estimation or multiplication to check my answer.
- Use estimation to place the first digit in a quotient.
- Use place value to divide..
- Use estimation or multiplication to check my answer.
- Understand a problem.
- Make a plan to solve.
- Solve a problem.

**Extend Activities:**

1. The Division Picture

**Materials**: Division Picture*, paper, craft supplies
Provide each student with Division Picture and a paper. Students will first draw the outline of a school building, which only includes the body and roof. Then, students will follow the directions to determine how many doors, windows, trees, or buses are present in their picture. While dividing, discard the remainders and only use the whole numbers to create each feature to the school building.

2. What's the Problem?

**Materials:** What's the Problem?*, scissors

Cut and pass out one card to each student. Students will need to create a division word problem using the two numbers provided on the card. Their word problem must also relate to the topic that is provided on the card as well. Encourage students to be creative in their word problems. Once completed, have students exchange word problems with a partner to solve and check for correctness.

**Gifted and Talented:**

1. Remember the Remainder

**Materials per pair:** Remember the Remainder Game Board*, spinner, counters, die

Each player will roll a die and move that many spaces on the game board. The number each player lands on will become the divisor in each player's division equation. Both players will then spin to determine the dividend in their equations. Players will solve their equation and record it. Continue to play until players have moved completely around the game board. Then, players will add up only their remainders. The player with the most points wins!

## Chapter 7: Divide Decimals

**STANDARDS**

5.NBT.A.2, 5.NBT.A.4, 5.NBT.B.7, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NBT.A.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.A.4 -** Use place value understanding to round decimals to any place.

**5.NBT.B.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.

**Objectives:**

- Explain how to divide a number by a power of 10.
- Explain patterns in the placement of the decimal point when dividing a decimal by a power of 10.
- Rename a dividend to estimate a quotient.
- Use compatible numbers to estimate a quotient.
- Explain different ways to estimate a quotient.
- Use a model to represent a decimal.
- Divide a model to show equal groups.
- Use a model to divide a decimal by a whole number.
- Use place value to divide.

- Place the decimal point in the quotient.
- Regroup when necessary.
- Use estimation to check my answer.
- Use place value to divide.
- Place the decimal point in the quotient.
- Regroup when necessary.
- Use estimation to divide.
- Use a model to represent a decimal.
- Divide a model to show equal groups.
- Use a model to divide a decimal by a decimal.
- Multiply a divisor and a dividend by a power of 10 to make the divisor a whole number.
- Place the decimal point in a quotient.
- Divide a decimal by a decimal.
- Explain when to insert one or more zeros in the dividend to find a quotient.
- Insert one or more zeros in a dividend to find a quotient.
- Recognize when a division problem is complete.

**Extend Activities:**

1. Divide and Connect

**Materials per pair:** Divide and Connect Game Board*, Divide and Connect Game Cards*, counters

Cut out the Divide and Connect Game Cards and place face down in between pairs of students. Player A will flip over the first card and solve to find the quotient. Player B will check Player A's answer. If Player A correctly answers the card, he/she finds the quotient on the Divide and Connect Game Board and covers it with their color counter. If Player A answers incorrectly, he/she loses their turn and it becomes the next player's turn. The first player to connect four of their counters in a row (vertically, horizontally, or diagonally) wins!

**Gifted and Talented:**

1. Decimal Division Puzzle

**Materials:** Decimal Division Puzzle*

Provide students with the cut-out pieces from the Decimal Division Puzzle. Students will complete the puzzle by matching the division expressions with their corresponding quotient.

**Note:** This activity can be completed individually or with a partner. If played with a partner, time each player as they complete the puzzle. The player who completes the puzzle faster wins!

## Chapter 8: Add and Subtract Fractions

### STANDARDS

5.NF.A.1, 5.NF.A.2, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NF.A.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,⅔ = 5/4 = 8/12 + 15/4 = 23/12 . (In general, a/b = c/d= (ad +bc/ bd).

**5.NF.A.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 ⅖ + ½ = 3/7 , by observing that 3/7 < 1/2 .

**Objectives:**

- Find the common factors of two numbers.
- Write equivalent fractions.
- Write a fraction in simplest form.
- Use a number line and benchmarks to estimate a fraction.
- Use mental math and benchmarks to estimate a fraction.
- Use benchmarks to estimate sums and differences of fractions.
- List multiples of numbers.
- Find a common denominator for two fractions.
- Write fractions using a common denominator.
- Write fractions using a common denominator.
- Add fractions with like denominators.
- Add fractions with unlike denominators.
- Write fractions using a common denominator.
- Subtract fractions with like denominators.
- Subtract fractions with unlike denominators.
- Add fractional parts **and** whole number parts of mixed numbers with unlike denominators.

- Use equivalent fractions to add mixed numbers with unlike denominators.
- Subtract fractional parts and whole number parts of mixed numbers with unlike denominators.
- Use equivalent fractions to subtract mixed numbers with unlike denominators.
- Understand a problem.
- Make a plan to solve.
- Solve a problem using an equation.

**Extend Activities:**

1. Race to Make Equivalent Fractions

**Materials**: Race to Make Equivalent Fractions*, dice

Students will take turns rolling two dice to create a proper fraction. They will write it in the box on their Race to Make Equivalent Fractions sheet and then race to see how many equivalent fractions they can write in the row. Students will then check each other's work.

2. What's Your Expression?

**Materials:** Hundred Grid Paper*, colored pencils, scrap paper
Students will work in pairs and each get a copy of the Hundred Grid Paper. One partner will draw a square that is 5x5 and design a studious face. The other student will work with the full Hundred Grid Paper and design an excited face. Both students will make sure the amount of squares they use to create the face is less than 20 and an odd number. Students will then write the number of shaded boxes out of the total number of boxes in their square as a fraction. They will add their fractions together and simplify the answer.

**Gifted and Talented:**

1. Tic-Tac-Subtract

**Materials per pair**: Tic-Tac-Subtract*, paper
Students play tic-tac-toe in pairs by subtracting fractions with unlike denominators. Students in each pair take turns picking a problem on the tic-tac-toe board and writing it on a separate sheet of paper to solve. If the student solves correctly, they write an X or O on that square. Students win by getting three in a row.

## Chapter 9: Multiply Fractions

### STANDARDS

5.NF.B.4, 5.NF.B.4a, 5.NF.B.4b, 5.NF.B.5a, 5.NF.B.5b, 5.NF.B.6, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

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

**5.NF.B.4a -** Interpret the product as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations . For example, use a visual fraction model to show (⅔) x 4 = 8/3 , and create a story context for this equation. Do the same with (⅔) x (⅘) = 8/15 . (In general, 9a/b) x (c/d) = (ab/bd)).

**5.NF.B.4 -** 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.B.5 -** Interpret multiplication as scaling (resizing), by:

**5.NF.B.5a -** 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.B.5b -** 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 to the effect of multiplying by 1.

**5.NF.B.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.

**Objectives:**

- Use a model to multiply a whole number by a fraction.
- Write a multiplication expression as a repeated addition expression.
- Write a multiple of a fraction as a multiple of a unit fraction.
- Divide a whole into equal parts.
- Use a model to find part of a group.
- Use a model to multiply a fraction by a whole number.
- Use a rule to multiply a whole number by a fraction.
- Use a rule to multiply a fraction by a whole number.
- Divide a whole into equal parts.
- Divide a unit fraction into equal parts.
- Use a model to find the product of two fractions.
- Multiply the numerators of two fractions.
- Multiply the denominators of two fractions.
- Use a rule to find the product of two fractions.
- Find the area of a rectangle with unit fraction side lengths.
- Find the number of rectangles with unit fraction side lengths it takes to fill a rectangle.
- Find the area of a rectangle with fractional side lengths.
- Use a model to find the product of two mixed numbers.
- Rewrite mixed numbers as improper fractions to find their products.
- Find the product of two mixed numbers.
- Determine whether a number is less than, greater than, or equal to 1.
- Compare a product to each of its factors.
- Explain why a product is less than, greater than, or equal to each of its factors.

Extend Activities:

1. Fraction Dominoes

**Materials per pair:** dominoes, whiteboards and markers

Provide pairs of students with dominoes and place them face down on a desk. Have each player choose two dominoes from the pile and arrange them to create two fractions. Using a whiteboard, have each player multiply the domino fractions together to find the product. The player with the greatest product keeps all the dominoes from that round. Continue to play by choosing two new dominoes until time is over or until all the dominoes have been used. The

player with the greatest number of dominoes wins!

**Gifted and Talented:**

1. Fraction Multiplication: Race to the Finish

**Materials per pair**: Race to the Finish Game Board*, Race to the Finish Game Cards*, counters

Provide each pair of students with a game board and cut out game cards face down in a pile. Players will take turns drawing a game card from the pile and completing the multiplication equation shown. Players will then move their counter the same number of spaces as the product. Continue to alternate turns and complete the multiplication equation until a player reaches the finish. **Note:** If the student does not complete the multiplication equation from the card correctly, they lose a turn and it becomes the next player's turn to choose a card. Players can either land on the finish square or pass it to end the game.

## Chapter 10: Divide Fractions

**STANDARDS**

5.NF.B.3, 5.NF.B.7, 5.NF.B.7a, 5.NF.B.7b, 5.NF.B.7c, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.NF.B.3 -** Interpret a fraction as division of the numerator by the denominator (i.e., ). 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 ¾ as the result of dividing 3 by 4, noting that ¾ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size ¾ . 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.B.7 -** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1]

**5.NF.B.7a -** Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (⅓ / 4 , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (⅓) / 4 = 1/12 because 1/12 x 4 = ⅓ .

**5.NF.B.7b -** Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for4 / (⅕) , and use a visual fraction model to show the quotient. Use the

relationship between multiplication and division to explain that 4 / (⅕ )=20 because 20 x (⅕) = 4 .

**5.NF.B.7c -** 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 ⅓ -cup servings are in 2 cups of raisins?

**Objectives:**

- Use a model to divide two whole numbers that have a fraction as the quotient.
- Use an equation to divide two whole numbers that have a fraction as the quotient.
- Interpret a fraction as division.
- Use a model to divide two whole numbers that have a mixed number as the quotient.
- Use an equation to divide two whole numbers that have a mixed number as the quotient.
- Write and solve a real-life problem involving division of whole numbers.
- Use a model to divide a whole number by a unit fraction.
- Use an equation to divide a whole number by a unit fraction.
- Write and solve a real-life problem involving division of a whole number and a unit fraction.
- Use a model to divide a unit fraction by a whole number.
- Use an equation to divide a unit fraction by a whole number.
- Write and solve a real-life problem involving division of a unit fraction and a whole number.
- Understand a problem.
- Make a plan to solve.
- Solve a problem using an equation.

**Extend Activities:**

1. Domino Division

**Materials per pair:** dominoes

Place the dominoes face down on a desk between pairs of students. Each player will choose a domino and its orientation. Players will then divide the top number (numerator) by the bottom number (denominator). The player with the greatest quotient wins the round and will keep all the dominoes. Continue to play until all dominoes have been used. The player with the greatest amount of dominoes wins!

**Gifted and Talented:**

1. Fraction Division Tic-Tac-Toe

**Materials per pair**: Fraction Division Tic-Tac-Toe Board*, counters

Provide a game board to each pair of students. Player A will choose a square from the game board and evaluate the expression. If they answer correctly, they will place a counter on the square. If the expression is answered incorrectly, they lose their turn and it becomes Player B's turn. Continue to play by alternating turns. The first player to three counters in a row wins!

**Extension:** Have students create their own board and play the game again.

## Chapter 11: Convert and Display Units of Measure

**STANDARDS**

5.M.A.1, 5.M.B.2, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.M.A.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.M.A.2 -** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

**5.M.A.2a -**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.

**5.M.A.2b -**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.

**Objectives:**

- Compare the sizes of two metric units of length.
- Write a metric length using a smaller metric unit.
- Write a metric length using a larger metric unit.
- Compare the sizes of two metric units of mass and capacity.
- Write metric masses and capacities using smaller metric units.
- Write metric masses and capacities using larger metric units.
- Compare the sizes of two customary units of length.

- Write a customary length using a smaller customary unit.
- Write a customary length using a larger customary unit.
- Compare the sizes of two customary units of weight.
- Write a customary weight using a smaller customary unit.
- Write a customary weight using a larger customary unit.
- Compare the sizes of two customary units of capacity.
- Write a customary capacity using a smaller customary unit.
- Write a customary capacity using a larger customary unit.
- Make a line plot.
- Interpret a line plot.
- Use a line plot to solve a real-life problem.
- Understand a problem.
- Make a plan to solve.
- Solve a problem.

**Extend Activities:**

1. Customary Units vs. Metric Units

**Materials:** paper

Provide students with paper and have them make a vertical fold down the middle. Students should label one side "Customary Units" and the other "Metric Units." Have students list as many facts they can think of and all the various units of measurement that describe each system under the appropriate side or label. Lastly, on the back of the paper, have students think about and write their thoughts about the following: "Do you think that the whole world should use one system? Which system should the whole world use customary units or metric units? Be sure to support and explain your thoughts."

2. Customary Units and Metric Units Flip Book

**Materials** Units of Measure Flip Book*, scissors

Provide students with the Units of Measure Flip Book and have them fill in the missing measurements. Be sure students fill in the abbreviations on the top tab, indicated by parentheses. Allow students to use the flip book to help study or find equivalent measurements.

**Note:** Have students fill in the missing measurements and abbreviations without their notes for an extra study activity.

**Gifted and Talented:**

1. Challenge the Calculator

**Materials per pair**: Equivalent Measurement Guess*, scissors

Cut out the Equivalent Measurement Guess cards and place them between players. Without viewing the measurement on the card, each player will pick up and place their card on their forehead. Taking turns, players will call out an equivalent measurement on their partner's card that will provide hints to the measurement on their partner's forehead. Players will guess the measurement on their forehead. Once guessed, players should keep the card and pick up another one to play again. Repeat until all cards are gone or until time is over.

## Chapter 12: Patterns in the Coordinate Plane

**STANDARDS**

5.G.A.1, 5.G.A.2, 5.OA.B.3, 5.DL.A.1, 5.DL.A.2, 5.DL.A.3, 5.DL.A.4,MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.G.A.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.A.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.OA.B.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.DL.A.1 -** Understand how different visualizations can highlight different aspects of data. Ask questions and interpret data visualizations to describe and analyze patterns.

**5.DL.A.2** - Develop strategies to collect, organize and represent data of various types and from various sources. Communicate results digitally through a data visual (e.g. chart, storyboard, video presentation).

**5.DL.A.3** - Collect and clean data to be analyzable (e.g., make sure each entry is formatted correctly, deal with missing or incomplete data).

**5.DL.A.4 -** Using appropriate visualizations (i.e. double line plot, double bar graph), analyze data across samples.

**5.DL.B.5** - Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). 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

**Objectives:**

- Use an ordered pair to identify the location of a point in a coordinate plane.
- Plot and label a point in a coordinate plane.
- Explain the relationship between two points that have the same x-coordinates or y-coordinates.
- Count grid lines to find the distance between two points.
- Use subtraction to find the distance between two points.
- Draw polygons in a coordinate plane.
- Identify polygons in a coordinate plane.
- Draw a symmetric shape in a coordinate plane given one half of the shape and a line of
- symmetry.
- Use ordered pairs to represent data.
- Graph data in a coordinate plane.
- Interpret data shown in a coordinate plane.
- Make a line graph using whole numbers and ½,¼,⅛.
- Analyze and interpret a line graph.

- Create a numerical pattern.
- Describe features of a numerical pattern.
- Describe the relationship between two numerical patterns.
- Generate two numerical patterns.
- Use appropriate visualizations (double line plot, double bar graph)
- Develop strategies to collect, organize and represent data of various types
- Use two numerical patterns to write and plot ordered pairs in a coordinate plane.
- Use a graph to describe the relationship between two numerical patterns.

**Extend Activities:**

1. Coordinate Pairs Bump

**Materials per pair:** Number Cards (0-9)*, counters, Large Coordinate Plane* Shuffle five sets of number cards 0-9 and place them in the middle of two players. Player A will draw two cards, the first card representing the *x*-coordinate and the second card representing the *y*-coordinate. Player A will locate their point on the Large Coordinate Plane and place a counter on it. Continue to play by alternating roles and locating the ordered pair on the game sheet. If an opponent's marker is already on a point, the player may "bump" the counter and replace it with their own. The goal is for players to create three counters in a row horizontally, vertically, or diagonally and players receive a point for doing so with their counters. Continue to play until a player reaches 5 points and wins! **Note**: Players do not lose points if their counter is bumped.

2. Coordinate Creation

**Materials:** Coordinate Creation Ordered Pairs*, colored pencils

Provide students with a coordinate plane and a copy of Coordinate Creation Ordered Pairs. Students will start with the first category's Shape 1 and plot the ordered pairs in order, connecting only the ordered pairs in Shape 1. Then, students will do the same for Shape 2. Once they are both complete, students will need to identify the two polygons that they just created. Continue in this manner until students have finished plotting each ordered pair and connecting each shape to reveal an animal.

**Note**: Students should have created a fish when complete.

Gifted and Talented:

1. Coordinate Line Graph

**Materials:** paper, craft supplies

Have students create an anchor chart to identify the various parts of a line graph. Make sure students reference that there should be a title and labels for the *x*-axis and y-axis. Remind students that sometimes graphs have a break. What does the break mean in a line graph? Once students have completed their anchor chart, have students compare plotting points on a coordinate plane to plotting points to create a line graph. How are coordinate planes and line plots similar or different?

## Chapter 13: Understand Volume

### STANDARDS

5.M.B.2, 5.M.B.3, 5.M.B.4, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

**5.M.B.2 -** Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

**5.M.B.2a -**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.

**5.M.B.2b -**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.M.B.3 -**Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

**5.M.B.4 -**Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

**5.M.B.4a -**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.M.B.4b -**Apply the formulas and 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.

**5.M.B.4c -**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.

**Objectives:**

- Count the number of unit cubes in a figure.
- Tell the volume of a solid figure in cubic units.
- Identify units as cubic inches, cubic feet, or cubic centimeters.
- Find the number of unit cubes in each layer of a rectangular prism.
- Use the number of unit cubes in each layer to find the volume of a rectangular prism.
- Write a formula for the volume of a rectangular prism.
- Explain how to use the area of the base to find the volume of a rectangular prism.
- Use a formula to find the volume of a rectangular prism.
- Find the height of a rectangular prism given the volume of the prism and the area of the base.
- Find an unknown dimension of a rectangular prism given the volume of the prism and the other two dimensions.
- Break apart a composite figure into rectangular prisms.
- Find an unknown dimension of a composite figure.
- Add the volumes of rectangular prisms to find the volume of a composite figure.

**Extend Activities:**

1. Rectangular Prism Tasks

**Materials:** Rectangular Prism Task Cards*, centimeter cubes

Cut out the Rectangular Prism Task Cards and distribute to students. Students will use centimeter cubes to construct the prisms and determine the dimensions. Have students record their answers on the task cards or a recording sheet. **Note**: This activity can be divided up into five different stations or completed all at one station.

Gifted and Talented:

1. Build the Volume

**Materials per pair:** building blocks, die

Provide pairs of students with building blocks and one die. First, partners will roll the die to determine the number of building blocks they will each use to construct a figure of their choice. Figures should be constructed without gaps or overlaps. Once partners are finished, they exchange figures and find the volume. Repeat by rolling the die again and constructing another figure.

**Note:** Prior to playing, determine if you will provide the dimensions of each building block, or if students will measure each block using a ruler.

## Chapter 14: Classify Two-Dimensional Shapes

### STANDARDS

5.G.B.3, 5.G.B.4, MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP.8

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

**Objectives:**

- Identify an angle of a triangle as right, acute, or obtuse.
- Determine whether sides of a triangle have the same length.
- Use angles and sides to classify a triangle.
- Identify parallel sides and sides with the same length in a quadrilateral.
- Identify right angles in a quadrilateral.
- Use angles and sides to classify a quadrilateral.
- Arrange quadrilaterals in a Venn diagram based on their properties.
- Use a Venn diagram to make statements about the relationships among quadrilaterals.

**Extend Activities:**

1. Wanted Quadrilateral

**Materials:** Wanted Poster*

Decide ahead of time if you would like students to choose their own quadrilateral to describe, or if you would like to assign quadrilaterals to each student. Students will draw their quadrilateral in the space provided on the Wanted Poster Instructional Resource. Students will then fill in the rest of the poster by describing the attributes of the quadrilateral. Encourage students to be creative when drawing and describing their quadrilateral.

2. Two-Dimensional Shapes Heads Up

**Materials per group:** Two-Dimensional Shapes Cards*

Cut out the Two-Dimensional Shapes Cards and place them face down. Without looking, Player A will choose a card and hold it to their forehead so that the rest of the group can see the card. Each member from the group will take a turn describing the two-dimensional shape to Player A, without saying its name. The group continues to describe the shape until Player A guesses the shape they have. Continue to play by alternating which player will choose a card to place on their forehead.

Gifted and Talented:

1. Quadrilateral Diagram

**Materials:** Quadrilateral Diagram*

Provide each student with the diagram and have them follow the descriptions to complete it. Once completed, have students find an object in the room that fits the description for each quadrilateral and draw a picture of the object next to its label.

**Note**: To be more selective, provide a variety of objects that students can choose from that matches the description of each quadrilateral.