Grade 5 Suggested Activities and Supplies to Support Mathematics Education

Below are activities, lessons, parent resources and literature that can be used to enhance and/or support 5th grade math instruction in the classroom. These activities use hands on concrete models to support conceptual understanding of the five domains. The activities take students from the concrete model to representational and the abstract understanding of the Florida Standards. They are written as a menu of options you may choose from dependent on the needs of your students.

Operations and Algebraic Thinking

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Cluster 1: Write and interpret numerical expressions
Cluster 2: Analyze patterns and relationships

Parent Resources

Bowling for Numbers
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43076

Seeing is Believing
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43074

Video Game Score
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43072

A bibliography of children's literature with a focus on expressions and numerical patterns is provided, which can be integrated so that students can connect through literature.

1. It Started with Pizza, Dawn McMillan
2. The World of Trade, Dawn McMillan
3. Night Skies, Dawn McMillan
4. Patterns in Nature, Dawn McMillan
5. My Lemonade Stand, Dawn McMillan

Watch Out for Parentheses 1 http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43071 Words to Expressions 1 http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43068 Fractal Tool http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43068	

Everything Balances Out in the End: Balancing Algebraic Understanding	http://www.cpalms.org/Public/PreviewResourceUrl/Preview/7892 This lesson focuses on simplification of numerical expressions using a pan balance applet. The Pan Balance - Numbers applet will allow students to practice order of operations by having them input equivalencies (which the module will record in the table on the right) and by selecting one operation at a time, they will come to see algebraic logic in their simplifications. **MAFS.5.OA.1.1:** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
Fly Runners Order of Operations MEA	http://www.cpalms.org/Public/PreviewResource/Preview/69627 This MEA is designed so that students will practice knowledge learned from Order of Operations. In the process, students will analyze marketing and advertising data in order to help Fly Runners Running Shoes choose the appropriate magazine to advertise with. **MAFS.5.OA.1.1:** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
Chairs Around the Table	http://www.cpalms.org/Public/PreviewResourceUrl/Preview/9841 This lesson allows exploration for students to discover effects of changes in seating when tables are moved together. Since pushing tables together makes the sides of the tables inaccessible, the teacher can use this to get students to come up with rules for linear patterns. These rules can be written on the board using variables to lay the groundwork for understanding the use of variables. **MAFS.5.OA.1.2:** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

Gummy vs. Gum (Number Pattern)	http://www.cpalms.org/Public/PreviewResourceUrl/Preview/7633 "In this lesson, students use gummy bears and sticks of gum to discover a number pattern and write an equation that describes it. This lesson should be conducted after students have worked with patterns and one- and two-step equations." from the Beacon Learning Center. **MAFS.5.OA.1.2:** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
Cool School	http://www.cpalms.org/Public/PreviewResourceUrl/Preview/7633 In this lesson, students will take an imaginary trip to my lake house. They will solve a variety of real life word problems. Once at the lake they will experience many activities where they will need number sense. For the assessment, students will record and analyze data in order to determine who the best angler was at "Cool School." **MAFS.5.OA.2.3:** 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.

Number and Operations in Base Ten

Cluster 1: Understand the place value system **Cluster 2: Perform operations with multi-digit whole numbers and with decimals to hundredths** **Parent Resources** **Place Value Number Line** http://www.cpalms.org/Public/PreviewResourceUrl/Preview/30209 **Adding and Subtracting with Decimals** http://www.cpalms.org/Public/PreviewResourceUrl/Preview/65607 **Base Blocks Decimals** http://www.cpalms.org/Public/PreviewResourceUrl/Preview/31830 **National Library of Virtual Manipulatives** http://nlvm.usu.edu/en/nav/grade_g_2.html	**A bibliography of children's literature with a focus on place value and the power of ten is provided, which can be integrated so that students can connect through literature.** 1. The Multiplying Menace Divides, Pam Calvert 2. Fractions are Parts of Things, Richard Dennis 3. The Dewey Decimal System, Allan Fowler
Place Value: From Models to Numbers	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73448 This is an introductory lesson on place value and decimals. Students will use base-ten models, illustrations, and numbers to show that a digit in the hundredths place is one-tenth (1/10) of the value of the digit in the tenths place.

	MAFS.5.NBT.1.1: 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.
Prediction Place Value Patterns!	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/72225 In this lesson, students will use guided notes to assist them in identifying and analyzing patterns among place value positions. Students will also watch an educational video to help them to draw conclusions, make connections and provide practice of the skill. **MAFS.5.NBT.1.1:** 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
Multiplying Around the Block	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/30773 This 5E lesson emphasizes the framework created in the lesson "Decimals Have a Point!" (ID: 30766) in which students to manipulate and understand the relationships between decimal place values through the thousandths. Students will have the opportunity to reference the pictorial model (see attached) to compare two decimals up to thousandths. This lesson is designed to be done in a 60 minute block.

	MAFS.5.NBT.1.3: Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
Building a Better Baseball Team	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/51459 In this MEA activity, students will be comparing and contrasting whole and decimal numbers in order to recruit a baseball player(s). **MAFS.5.NBT.1.3:** Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Area Models to Algorithms ***Your students had extensive work with the concrete and representational aspect of this standard. You are bringing them to the abstract. Be sure they see the connection between the area model and partial product to the algorithm. Bridge that gap from representational to abstract by showing them both side by side. Don't take away the representational until they see the connection. Some will see the connection sooner than others. Be patient and it will pay off in the end.***	http://www.cpalms.org/Public/PreviewResource/Preview/73394 Students will investigate the standard algorithm of two-digit by two-digit multiplication and how it connects and relates to the area model. This will provide an introduction to the standard algorithm. **MAFS.5.NBT.2.5:** Fluently multiply multi-digit whole numbers using the standard algorithm.
Area Model of Multiplication Using Base 10 Manipulatives (Double Digit Multiplication) ***Your students had extensive work with the concrete and representational aspect of this standard. You are bringing them to the abstract. Be sure they see the connection between the area model and partial product to the algorithm. Bridge that gap from representational to abstract by showing them both side by side. Don't take away the representational until they see the connection. Some will see the connection sooner than others. Be patient and it will pay off in the end.***	http://www.cpalms.org/Public/PreviewResource/Preview/8112 Students will use base 10 manipulatives to build a rectangular array to represent double digit multiplication. Students will make the connection between the standard algorithm and the rectangular array **MAFS.5.NBT.2.5:** Fluently multiply multi-digit whole numbers using the standard algorithm.

Formative Assessments for MAFS.5.NBT.2.5	
Complete the Multiplication Problem	http://www.cpalms.org/Public/PreviewResource/Preview/58070 Students are asked to finish a multiplication problem that has already been started using the standard algorithm.
Find the Multiplication Error	http://www.cpalms.org/Public/PreviewResource/Preview/58067 Students are asked to find the error in a multiplication problem involving a three-digit and a two-digit number.
Multiplying Using the Standard Algorithm	http://www.cpalms.org/Public/PreviewResource/Preview/58068 Students are asked to complete two multiplication problems using the standard algorithm.
More Multiplication Using the Standard Algorithm	http://www.cpalms.org/Public/PreviewResource/Preview/58072 Students are asked to complete two multiplication problems using the standard algorithm.

Easy as Pie Division!	http://www.cpalms.org/Public/PreviewResource/Preview/49754 This is a hands-on lesson to show the relationship between division and multiplication. It provides a different method for solving long division that my students love. **MAFS.5.NBT.2.6:** 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.
Dividing for Equal Groups	http://www.cpalms.org/Public/PreviewResource/Preview/73315 Given situational stories, students will use base 10 blocks to model division in order to solve problems. Stories will include a variety of problems including 2 digit dividends by 1 digit divisors, 3 and 4 digit dividends by 1 digit divisors, and 3 and 4 digit dividends by 2 digit divisors. **MAFS.5.NBT.2.6:** 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.
Diving Deeper into Division	http://www.cpalms.org/Public/PreviewResource/Preview/36233 This lesson introduces students to dividing with 2 digit divisors Students are asked to apply strategies that they learned in dividing with 1 digit divisors such as partial quotients or breaking numbers apart using the distributive property.

	MAFS.5.NBT.2.6: 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.
Make a Funny Partial Quotient Division Story	http://www.cpalms.org/Public/PreviewResource/Preview/72731 This lesson introduces students to the area model and the partial quotient model to solve division problems with 2-digit divisors. Students are asked to apply both strategies to solve funny division problems that they help create by inserting information that is left blank in the story problems. **MAFS.5.NBT.2.6:** 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.
Dividing for Equal Groups	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73315 Given situational stories, students will use base 10 blocks to model division in order to solve problems. Stories will include a variety of problems including 2 digit dividends by 1 digit divisors, 3 and 4 digit dividends by 1 digit divisors, and 3 and 4 digit dividends by 2 digit divisors. **MAFS.5.NBT.2.6**: 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.
What Are They Thinking? Understanding Division	http://www.cpalms.org/Public/PreviewResource/Preview/40001 This lesson uses a discovery approach to exploring the meaning of division. The students will utilize math practice standards as they analyze math solutions and explain their own solutions. **MAFS.5.NBT.2.6:** 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.
Patty's Party Planning	http://www.cpalms.org/Public/PreviewResource/Preview/47915 Students will help a party planner determine which party location is the best one to use for this situation. They will calculate the cost of the banquet hall rental based on the number of people, number of tables and hourly rental of the location by using division and multiplication. **MAFS.5.NBT.2.6:** 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.
Formative Assessments for MAFS.5.NBT.2.6	
Driving to Alaska	http://www.cpalms.org/Public/PreviewResource/Preview/58634 Students are asked to solve a division word problem with a two-digit divisor using a strategy based on place value.
Analyzing and Applying Division	http://www.cpalms.org/Public/PreviewResource/Preview/58640 Students are asked to analyze and explain another student's division work in terms of a partial quotients strategy and to apply this strategy to another division problem.
Dividing Using an Area Model with Larger Divisors	http://www.cpalms.org/Public/PreviewResource/Preview/58633 Students are asked to interpret a division problem with a two-digit divisor that has been completed using an area model. If the student is successful, he or she is asked to determine the solution to a division problem with a two-digit divisor using an area model.
Dividing Using Place Value With Larger Divisors	http://www.cpalms.org/Public/PreviewResource/Preview/58632 Students are asked to complete a division problem using place value.

Dividing Decimals Investigation	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/27706 In this introductory lesson, students test how the basic operations performed on the dividend and divisor affect the quotient of a pair of numbers. Students then conclude whether the results of their trials can be applied to solve problems with a decimal divisor. **MAFS.5.NBT.2.7:** 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.
I See! Division with the Distributive Property	http://www.cpalms.org/Public/PreviewResource/Preview/72779 In this lesson, students will use visual models to represent division using the distributive property as a strategy. Students will have an understanding of how to decompose numbers in the context of division problems using an area model. **MAFS.5.NBT.2.7:** 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.

How Much Did I Earn? Division with Decimals	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73458 This lesson will introduce division of decimals using place value decomposition. Students will use base 10 blocks, division strategies and place value knowledge to divide decimals by whole numbers. **MAFS.5.NBT.2.7:** 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.

Numbers and Operations - Fractions

Cluster 1: Use equivalent fractions as a strategy to add and subtract fractions

Cluster 2: Apply and extend previous understandings of multiplication and division to multiply and divide fractions

Parent Resources

Explaining Fraction Equivalence with Pictures
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43264

Fraction Machine
http://www.cpalms.org/Public/PreviewResourceUrl/Preview/42143

Adding and Subtracting Fractions
http://www.cpalms.org/Public/PreviewResourceUrl/Preview/64959

Using Benchmarks to Compare Fractions
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43242

Sugar in six cans of soda (visualize multiplication of a fraction)
http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43243

A bibliography of children's literature with a focus on equivalent fractions and multiplying and dividing them is provided, which can be integrated so that students can connect through literature.

1. Funny and Fabulous Fraction Stories, Dan Greenberg
2. Piece = Part = Portion, Scott Gifford
3. Multiplying Menance, Pam Calvert
4. Cut Down to Size at High Noon, Scott Sundby

Diffy Virtual Manipulative http://www.cpalms.org/Public/PreviewResourceUrl/Preview/18471 **Egyptian Fractions** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43171 **Fractions – Adding** http://www.cpalms.org/Public/PreviewResourceUrl/Preview/30293 **Banana Pudding** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43181 **Folding Strips of Paper** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43153 **What is 23 ÷ 5?** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43077 **National Library of Virtual Manipulatives** http://nlvm.usu.edu/en/nav/grade_g_2.html	

Picture This! Fractions as Division	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46576 In this lesson the student will apply and extend previous understandings of division to represent division as a fraction. This includes representations and word problems where the answer is a fraction. **MAFS.5.NF.2.3:** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem
Fraction Frenzy! (Division/Fractional World Problems)	http://www.cpalms.org/Public/PreviewResource/Preview/72747 Students will draw models to solve real-life word problems and show the relationship between division and fractions. By the end of this lesson, they should be able to create their own word problems and explain if their answer will be a mixed number or fractional part. **MAFS.5.NF.2.3:** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Sharing Fairly	http://www.cpalms.org/Public/PreviewResource/Preview/28839 The students will connect fractions with division. They will solve word problems involving dividing whole numbers by using the strategy of drawing a model and/or equations with a fraction or mixed number for the answer. Next they will write word problems with a story context that represents problems involving division of whole numbers that lead to a fraction or mixed number answer. **MAFS.5.NF.2.3:** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
Those Pesky Remainders	http://www.cpalms.org/Public/PreviewResource/Preview/29139 This is a lesson to help students understand how to interpret the remainder in a division problem. Real world problems are presented in a PowerPoint so students may visualize situations and discover the four treatments of a remainder. Fourth grade does not have to translate remainders to decimals or fractions. **MAFS.5.NF.2.3:** Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Discovering Common Denominators	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/30113 Students use pattern blocks to represent fractions with unlike denominators. Students discover that they need to convert all the pattern blocks to the same shape in order to add them. Therefore, they find and use common denominators for the addition of fractions. **MAFS.5.NF.1.1:** 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. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
Estimating Fractions Using Benchmark Fractions 0, ½, or 1	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/49761 In this lesson, students use models (fractions tiles or number lines) to estimate fractions using benchmark fractions of 0, 1/2, or 1. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Fractions make the real WORLD problems go round	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73030 In this lesson students will use a graphic organizer to solve addition and subtraction word problems. Students will create their own word problems in PowerPoint, by using pen and paper, or dry erase boards to help them to connect to and understand the structure of word problems. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
Using Models to Add Fractions with Unlike Denominators	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/28336 This lesson is specific to adding fractions with unlike denominators. It requires students to already have a working knowledge of adding fractions with common denominators, and equivalent fractions. Subtracting fractions with unlike denominators will follow in a subsequent lesson, as the two should be taught on separate days. **MAFS.5.NF.1.1:** 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.
Using Models to Subtract Fractions with Unlike Denominators	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/29664 This lesson is specific to subtracting fractions with unlike denominators. It requires students to already have a working knowledge of subtracting fractions with common denominators, and equivalent fractions. Adding fractions with unlike denominators was taught in a previous lesson, and the two should be taught on separate days.

	MAFS.5.NF.1.1: 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.
Aaron and Anya's Discovery: Adding Fractions with Unlike Denominators	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/72825 In this situational story, Aaron and Anya find several pieces of ribbon/cord of varying fractional lengths. They decide to choose 3 pieces and make a belt. All of the fractions have different denominators; students have to determine common denominators in order to add the fractional pieces. After students successfully add three fractional pieces, they make a belt and label it with their fractional pieces. **MAFS.5.NF.1.1:** 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. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
Adding and Subtracting Mixed Numbers with Unlike Denominators	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/33201 This lesson helps fifth graders combine their understanding of adding and subtracting fractions with unlike denominators, finding equivalent fractions, and adding and subtracting mixed numbers with like denominators to move on to adding and subtracting mixed numbers with unlike denominators.

	MAFS.5.NF.1.1: 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.
Let's Have a Fraction Party	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73106I In this lesson, students will use addition and subtraction of fractions with unlike denominators to solve word problems involving situations that arise with the children who were invited to a party. They will use fraction strips as number models and connect the algorithm with these real-life word problems. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
Multiplying a Fraction and a Fractions	http://www.cpalms.org/Public/PreviewResource/Preview/72343 This lesson focuses on providing students with real-world experiences where they will be required to multiply fractions. A variety of situational problems involving scaling are provided for different levels of learners. Students will be required to use visual fraction models or equations to represent the problem.

	MAFS.5.NF.2.4: Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product *(a/b) × q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b*. *For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* 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. **MAFS.5.NF.2.5:** Interpret multiplication as scaling (resizing), by: a. 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. 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. **MAFS.5.NF.2.6:** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
Area Models: Multiplying Fractions	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/38004 In this lesson students will investigate relationship between area models and the concept of multiplying fractions. Students will use area model to develop understanding of the concept of multiplying fractions as well as to find the product of two common fraction. The teacher will use the free application GeoGebra (see download link under Suggested Technology) to provide students with a visual representation of how area models can be used at the time of multiplying fractions. **MAFS.5.NF.2.4:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product *(a/b) × q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*

	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.
Exploring Fraction Multiplication	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/30150 Students explore the multiplication of a fraction times a fraction through story problems about a garden using models on Geoboards and pictorial representations on grid paper. Students make a connection between their models and the numerical representation of the equation. **MAFS.5.NF.2.4:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product *(a/b) × q* as a parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)* 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 **MAFS.5.NF.2.6:** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
Banana Pudding	http://www.cpalms.org/Public/PreviewResource/Preview/43181 The purpose of this task is to provide students with a concrete situation they can model by dividing a whole number by a unit fraction. For students who are just beginning to think about the meaning of division by a unit fraction (or students who have never cooked), the teacher can bring in a 1/4 cup measuring cup so that students can act it out. If students can reason through parts (a) and (b) successfully, they will be well-situated to think about part (c) which could yield different solution methods. **MAFS.5.NF.2.7:** 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 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*
Painting a Room	http://www.cpalms.org/Public/PreviewResource/Preview/43101 The purpose of this task is to provide students with a situation in which it is natural for them to divide a unit fraction by a non-zero whole number. Determining the amount of paint that Kulani needs for each wall illustrates an understanding of the meaning of dividing a unit fraction by a non-zero whole number. **MAFS.5.NF.2.7:** 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 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*
How many servings of oatmeal?	http://www.cpalms.org/Public/PreviewResource/Preview/43121 This task provides a context for performing division of a whole number by a unit fraction. This problem is a "How many groups?" example of division: the "groups" in this case are the servings of oatmeal and the

	question are asking how many servings (or groups) there are in the package. **<u>MAFS.5.NF.2.7:</u>** 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 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*

Salad Dressing	http://www.cpalms.org/Public/PreviewResource/Preview/43079 The purpose of this task is to have students add fractions with unlike denominators and divide a unit fraction by a whole number. This accessible real-life context provides students with an opportunity to apply their understanding of addition as joining two separate quantities. **MAFS.5.NF.1.2:** Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. **MAFS.5.NF.2.7:** 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 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?*
It's My Party and I'll Make Dividing by Fractions Easier if I Want to!!	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73798 During this lesson students will relate their understanding of whole number division situations to help them interpret situations involving dividing by unit fractions. They will then develop models and strategies for representing the division of a whole number by a unit fraction. The students will work on math practice standards as they work with a partner to distinguish correct logic or reasoning from that which is flawed, and explain flaws when they are present **MAFS.5.NF.2.7:** 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.

Measurement and Data

Cluster 1: Convert like measurement units within a given measurement system **Cluster 2: Represent and interpret data** **Cluster 3: Geometric measurement: understand concepts of Volume to multiplication and to addition** **Parent Resources** **National Library of Virtual Manipulatives** http://nlvm.usu.edu/en/nav/grade_g_2.html	**A bibliography of children's literature with a focus on measurement, volume and data is provided, which can be integrated so that students can connect through literature.** 1. Estimating Volume by Counting on Frank, unknown 2. Tiger Math Learning to Graph from a Baby Tiger, Ann Whitehead Nagda & Cindy Bickel 3. The Metric System, Paul Challen 4. Millions to Measure, David M. Schwartz
Conversion Excursion	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/28132 This lesson will equip students with the understanding of why the metric system is important and see the connections between place value and metric system charts. The students will use metric system chart to convert between metric units to solve real-world problems. **MAFS.5.MD.1.1:** Convert among different-sized standard measurement units (i.e., km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec) 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.

Free Flight in Return for your Ranking!	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/72621 This lesson asks students to rank four promotional deals that a travel agency is running. Before they make their decision, the students have to convert the duration of the trip to the same unit so that they can analyze the data. **MAFS.5.MD.1.1:** Convert among different-sized standard measurement units (i.e., km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec) 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.
April Showers Bring May Flowers – Line Plots	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73039 In this lesson, students will create a line plot that displays rainfall data. They will use the data from the line plot to answer questions using addition, subtraction, multiplication, and division of fractions. **MAFS.5.MD.2.2:** 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.
Line Plotting with Fractions Chicago Pizza Style	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73102 In this lesson, students will be making a line plot and recording fractional data (1/2, 1/4, and 1/8) on their line plot. Students will then use fraction operations to solve problems involving data presented in their line plots.

	MAFS.5.MD.2.2: 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.
Bakery Boxes in the Mail	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/70294 Students need to make decisions about the correct bakery box to send cookies through the mail to fill orders. Students need to consider the capacity, dimensions, and volume of the boxes in terms of how many cookies each box will hold. **MAFS.5.MD.3.5:** 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. **MAFS.5.NBT.2.7:** 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
"What's the part? What's the whole?"	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/73408 Students will build "apartments" with centimeter cubes by packing boxes (template included). In addition, they will use centimeter cubes to build a variety of rectangular prisms and record the area of the base (B) and height (h) on a worksheet. They will use that information to complete the volume formula, V = B x h. Students will think about how the volume changes as the height and base of rectangular prisms change. **MAFS.5.MD.3.3:** 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.
Shoe Closet MEA	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/32290 In this open-ended problem, students will work in teams to determine a procedure for ranking shoe closets for a company to purchase. Students will need to calculate the cubic feet of space for the closet, make decisions based on a table of data, and write a letter to the client providing evidence for their decisions. **MAFS.5.MD.1.1:** Convert among different-sized standard measurement units (i.e., km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec) 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. **MAFS.5.MD.3.5:** 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.

Geometry

Cluster 1: Graph points on the coordinate plane to solve real-world and mathematical problems. **Cluster 2: Classify two-dimensional figures into categories based on their properties.** **Parent Resources** **Battle Ship Using Grid Paper** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/43222 **BattleGraph** http://www.cpalms.org/Public/PreviewResourceUpload/Preview/30091 **Clipart: Geometric Shapes** http://www.cpalms.org/Public/PreviewResourceUrl/Preview/14637 **National Library of Virtual Manipulatives** http://nlvm.usu.edu/en/nav/grade_g_2.html	**A bibliography of children's literature with a focus on 2-dimensional shapes and graphing is provided, which can be integrated so that students can connect through literature.** 1. X marks the Spot, Lucille Recht Penner 2. "Shapes" A Light in the Attic, Shel Silverstein 3. Shape Up!, David Adler 4. Sir Cumference and the Vikings Map, Cindy Neuschwander

Design A Town Coordinates	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/44987 Students will learn how to plot coordinates on the x and y-axis in the first quadrant. Students will start with plotting and creating simple shapes and progress through more complex shapes. The wrap up lesson will have the students plot and create their own town. **MAFS.5.G.1.1:** 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).
Did you slow the flow, Joe?	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/76426 Students will identify the effects of friction on the falling rates of an object in different liquids using speed calculation. With these calculations, the students will synthesize a cause/effect statement from the results comparing thickness (viscosity) of the liquid and the speed on a falling object.

	MAFS.5.G.1.2: 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.
Map It Out!!	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46616 In this lesson, students will use real life maps and apply their knowledge of coordinates (ordered pairs) in order to identify and name specific locations on a map and explain the relevance to their life. **MAFS.5.G.1.2:** 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.
Bridge to Perfection	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/48105 During this activity, students will read a book about the Brooklyn Bridge. After whole class discussion, children will explore different types of bridges and data, in order to decipher which bridge is the strongest. The students will work collaboratively in groups with assigned student roles. Students

	will utilize Higher Order thinking to create a solution. The culminating activity is a presentation of solution to whole class. **MAFS.5.G.2.3:** Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.
Where in the Venn are the Quadrilaterals?	http://www.cpalms.org/Public/PreviewResourceLesson/Preview/49718 "*Where in the Venn are the Quadrilaterals?*" is an activity that helps the student to develop a better understanding of classifying two-dimensional figures in a hierarchy based on properties. **MAFS.5.G.2.4:** Classify and organize two-dimensional figures into Venn diagrams based on the attributes of the figures.

Supply List

Suggested class supplies for each student

Math Notebook/Journal
Math Folder
Scissors
Construction paper
Colored pencils
Pencils
Index cards
Place value charts thru hundredths
Rulers

Operations and Algebraic Thinking

(class set) place value blocks
cm graph paper

Number and Operations in Base Ten

(class set) place value blocks
place value charts
dimes, pennies to relate to decimal value

Numbers and Operations – Fractions

(class set) fraction bars
(class set) fraction circles
(class set) pattern blocks
(class set) colored tiles
inch graph paper for class use
cm graph paper

Measurement and Data

(12) meter/yard sticks
rectangular prism (i.e. cereal box)
(class set) cm cubes
cm graph paper

Geometry

(class set) tan grams
(class set) two colored square tiles
(class set) pattern blocks
(per 2-3 students) 2-D shapes
cm graph paper