

ACCRS: 4.1
 Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

<p>Mastered: Students can interpret a multiplication equation as a comparison.</p>	<p>Present: Students will apply multiplication comparison strategies in words and equations to complete a multiplication math rebus story.</p>	<p>Going Forward: Students will complete the Think Fast activity to demonstrate a more complex understanding of multiplication theory.</p>
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Present and Going Forward Vocabulary:
 Equation, multiplication, compare

Career Connections:
 Accountant, Landscaper, Engineer, Day Trader, Air Traffic Controller

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)
Students may choose one activity to complete.

Activity 1: Multiplication Math Rebus Story Teacher will provide ten multiplication problems.
Student Instructions:

1. Choose at least four of the ten multiplication problems given.
2. Write a comparing multiplication equation for each.
3. Use the Rebus Story Matrix to help you make up a story that includes all four equations.
 - Follow the directions given at the top of the Story Matrix page to choose a main character, setting, story problem, and story solution.
 - Draw a picture to go with each of the equations in your story.
 - **Remember to make your explanation of each equation as a comparing problem fit naturally within your story.**

Activity 2: THINK FAST
Student Instructions: Follow the directions at each letter. Write your answers as quickly as possible on a separate piece of paper. How many of these can you complete?

P	List three “PROPERTIES” of multiplication.
R	“REPRESENT” a multiplicative comparison problem using words and pictures.
O	Write 10 multiplication equations. “ORDER” the equations from greatest to least. (Example: $6 \times 8 = 48$; $3 \times 7 = 21$; $2 \times 5 = 10$)
D	“DRAW” an array that shows a squared number.
U	List two ways you “USE” multiplication in your everyday life.
C	Research three or more “CAREERS” that require multiplication.
T	“THINK” of a word problem in which the size of the group is unknown. Write it.

Literature Connections/Resources:

- Giganti, Paul Jr. *Each Orange had Eight Slices*. NY: Green Willow Books. 1992.
- Murphy, Stuart. *Safari Park*. NY: Harper Collins. 2001.
- Dee, Ruby. *Two Ways to Count to Ten: A Liberian Folktale*. NY: Henry Holt & Co. 1990.
- Website: www.math-play.com
- Website: www.arcademickillbuilders.com
- Website: <http://illuminations.nctm.org> (Concentration)

ACCRS: 4.2

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

Mastered:

Students can multiply or divide to solve word problems involving multiplicative comparison e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

Present:

Students will distinguish between additive vs. multiplicative comparisons.

Going Forward:

Students will make up their own multiplication story using word problems to illustrate incidents or circumstances in the story. They will solve the problems using drawings and equations. Use the book, *Math Curse* as an illustration. (See “Literature Connection” for information about this book.)

Present and Going Forward Vocabulary:

Multiply, divide, product, quotient, divisor, dividend

Career Connections:

Actuary, Attorney, Biostatistician, Cost Estimator, Contractor

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A, and Student Project Planner is located in Appendix B.)

Students may choose one activity.

Activity 1: Multiplication Mayhem: (Teacher Answer Key is located in Appendix A- Multiplication Mayhem ANSWER KEY.)

Student Instructions: Categorize each problem by its type of “unknown” (unknown group size unknown number of groups, or unknown total) and type of comparison (additive or multiplicative). Then complete the table on page 2.

In the table on page 2, fill in your categorizations for each problem as directed on the Student Page, and then express each as an equation.

Problems:

1. A bus is twice as heavy as a truck. The bus weighs 4,000 pounds. How much does the truck weigh? (See example in table below.)
2. Joe has 6 baseball cards, Alexander has four times as many as Joe, and Silas has 3 times as many as Joe. How many baseball cards do Alexander and Silas have?
3. A slinky was 8cm long. It is stretched to 24cm long. How many times longer is the slinky now than it was to begin with?
4. A muffin recipe requires $\frac{2}{3}$ of a cup of milk. Each recipe makes 12 muffins. How many muffins can be made using 6 cups of milk?
5. A group of friends are planning to car pool to a football game in the neighboring town. Three of the friends have volunteered to drive their cars. Each car can carry 6 passengers, including the driver. How many people can be transported to the game?
6. The teacher has purchased new curtains to put up in the 4th grade classroom. She also bought curtain rods to hang 8 sets of curtains. The rods came with a bag containing a total of 32 screws. How many screws will be needed to hang each curtain rod?
7. There are 30 strawberry cupcakes at the bakery. There are 5 times as many strawberry cupcakes as vanilla. How many vanilla cupcakes are there?
8. Sharon ran 6 laps of the track. Melissa ran 3 times as many laps of the track as Sharon. How many laps did Melissa run?
9. A gorilla weighs 300 pounds. An elephant weighs 5,000 pounds. How many times heavier is the elephant than the gorilla?
10. Mark saved \$72 this month. Last month he saved \$9. How many times as much money did Mark save this month as last?

Problem Number	Unknown (X the correct box.)			Equation	Additive or Multiplicative (X the correct box.)	
	Total?	Group Size?	# of Groups?		Additive	Multiplic.
1	X			$4000 \div 2 = X$		X

Activity 2: Math Mania:

Students will write a multiplication story patterned after the book, Math Curse by John Scieska.

Student Instructions: Write a story about a day in your life, showing all of the ways you use math—especially multiplication. You may want to use the Project Planner found in Appendix 2 to complete your project.

1. Read *Math Curse* by Jon Scieska.
2. Think about a normal day in your life. Make a list of the many, varied, unusual situations in which you use math, especially the times that you use multiplication in order to get through the day. (Do not include the math you do in your Math class at school.)
3. Write an equation for each of the situations in your list.
4. Using the list, write a story about a day in your life that includes these mathematical situations.
5. Write the math problems in your story as equations in the margins or somewhere on the page near where it is used in your story.
6. Feel free to include humor, as in the book, *Math Curse*. Illustrate your story and draw the solution to the multiplication equations you included.

Literature Connections/Resources:

- Anno, Mitsumasa. Anno’s Magic Seeds. NY: Puffin Books. 1999.
- Burns, Marilyn. Spaghetti and Meatballs. NY: Scholastic Books. 2008.
- Lewis, C.S. The Lion, The Witch, and The Wardrobe. NY: HarperCollins. 2009.
- Murphy, Stuart. Divide and Ride. NY: Harper Collins. 1997.
- Scieska, Jon. Math Curse. NY: Viking Juvenile Publishing. 1995.
- Website: <http://multiplication.com>
- Website: <http://www.thinkingblocks.com>

ACCRS: 4.3

Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Mastered:

Students can solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.

Present:

Students will solve multistep word problems by completing the activity.

Going Forward:

Students will write a pretend manual on how to solve problems for their classmates.

Present and Going Forward Vocabulary:

Whole numbers, divide, remainder, estimate, rounding

Career Connections:

Engineer, Taylor, Seamstress, Accountant, Brick Mason, Baker, Chef, Athletic Coach, Band Director

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)**Multiplication / Division Math Operations Story***Student Instructions:*

Write a multi-step MULTIPLICATION and / or DIVISION word problem about a day you had when it seemed as though TOO many things were going wrong! Your word problem must have multiple steps and use either 19 or 23 as a factor. Write your word problem (including your answer), then write a short story using your word problem. Draw a picture to match your story.

Literature Connections/Resources:

- Mahy, Margaret. *17 Ings and 42 Elephants*. NY: Dial Books. 1987.
- Murphy, Stuart J. *Coyotes All Around*. NY: Harper Collins. 2003.
- Pinczes, Elinor J. *A Remainder of One*. NY: Scholastic. 1995.
- Website: www.mathplayground.com (Word Problems- Hoops, Mr. Tightwod's Barbecue, and Word Problems with Katie)

ACCRS: 4.4
 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

<p>Mastered: Students can find all factor pairs for a whole number in the range 1-100, recognize that a whole number is a multiple of each of its factors, determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.</p>	<p>Present: Students will determine whether a given whole number is in the range 1-100.</p>	<p>Going Forward: Students will create a book with factor pairs for whole numbers in the range 1-100 within the school year.</p>
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Present and Going Forward Vocabulary:
 Factors, prime number, composite number, common multiples, least common multiples

Career Connections:
 Software Engineer, Operations Research Analyst, Civil Engineer, Robotics Engineer

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A, and the Primary Project Planner is located in Appendix B.)

Tic-Tac-Toe:
Student Instructions: Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE. Use a 100s chart found at : <http://illuminations.nctm.org/lessons/HundredsChart.pdf> to help you to do the activities. Complete the contract to give to your teacher. You may want to plan your products using the organizational tool, *Primary Project Planner*.

1. How many factors do the numbers 24 and 36 have in common?	2. List numbers on the 100s chart that have more than six factors.	3. List the factors of 25.
4. Which numbers only have two factors?	5. What factors do the numbers 50 and 75 have in common?	6. How many factors do the numbers 46 and 50 have in common?
7. List the factors of 100.	8. How many numbers have ten or more factors?	9. List the numbers on the 100s chart that have four factors.

Literature Connections/Resources:

- Schwartz, Richard. *You Can Count on Monsters*. Boca Raton, FL: A.K. Peters. 2010.
- Scieska, Jon. *Math Curse*. NY: Viking Juvenile Publishing. 1995.
- Tang, Greg. *The Grapes of Math*. NY: Scholastic Books. 2004.
- Factor Trees activity found at: www.mathplayground.com
 - Factor Game found at: <http://illuminations.nctm.org>
 - Hundreds Chart found at: <http://illuminations.nctm.org/lessons/HundredsChart.pdf>

ACCRS: 4.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

Example: Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence, and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Mastered:

Students can generate a number or shape pattern that follows a given rule and identify apparent features of the pattern that were not explicit in the rule itself.

Present:

Students will generate a number pattern by completing the Math and Children’s Literature activity.

Going Forward:

Students will make up a number pattern using odd and even numbers and challenge a friend to explain the rule for why the numbers in their patterns continue to alternate as they do.

Present and Going Forward Vocabulary:

Odd, even, pattern, sequence

Career Connections:

Computer Scientist, Engineer, Cryptologist, Day Trader

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

Students may choose one activity to complete.

Activity 1: Math and Children’s Literature

Student Instructions: Complete the activity after reading the book, My Even Day and One Odd Day by Doris Fisher.

Name of Book: _____

Author: _____

Math Concepts found in book: _____

Math Misconceptions: _____

Questions to research: _____

Final Project will be

- | | | | | |
|--------------|---------------|--------------------|-----------|---------------|
| Poster | PowerPoint | Comic Strip | New Story | Rewrite Story |
| Report | Song | Play or skit | Editorial | Commercial |
| Speech | Urgent E-mail | Instruction manual | | |
| Other: _____ | | | | |

Project Deadline: _____

Resources: (Must use at least two primary sources)

Books:

Magazines:

Websites:

Videos:

Activity 2: I CAN...(Student pages are located in Appendix A.)

Student Instructions: Choose one or more of the activities to complete. If you wish, you may add

another activity about odd and even numbers to the list after your teacher approves it.

1. Conduct a survey of the class and graph the results to answer the following questions:
 - How many students have birthdays in odd months? Even months?
 - How many have families with an odd number of members? Even members?
 - Ages of other students in the class. How many are odd? How many are even?
2. Make a list of things that come (or are grouped) in odd numbers.
 - Make up an adventure story about what would happen if we couldn't use even numbers.
 - Make up an adventure story about what would happen if we couldn't use odd numbers.
3. Write or record a story of what would happen if we couldn't use even numbers.
4. Write or record a story of what would happen if we couldn't use odd numbers.

Literature Connections/Resources:

- Murphy, Stuart J. Too Many Kangaroo Things to Do! St. Louis MO: Turtleback Publishers. 1996.
- Aker, Suzanne. What Comes in 2's, 3's, and 4's. NY: Alladin Paperbacks. 1990.
- Fisher, Doris. My Even Day and One Odd Day. Mount Pleasant, SC: Sylvan Dell Publishing Co. 2007.
- Toy Hong, Lily. Two of Everything. Mountain Grove, IL: Albert Whitman Co. 1993.

- Website: www.mathsolutions.com (Caterpillar Problem, Rocket Problem)
- Website: www.mathwire.com (Investigating Growing Patterns)

ACCRS: 4.6

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

Example: Recognize that $700 \div 70 = 10$ by applying concepts of place value and division.

Mastered:

Students can recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

Present:

Students will recognize that in a multi-digit whole number, a digit in one place represents one hundred times what it represents two places to its right.

Going Forward:

Students will recognize that in a multi-digit whole number, a digit in one place represents one thousand what it represents three places to its right.

Present and Going Forward Vocabulary:

Hundreds, thousands, place value, represents, right

Career Connections:

Doctor, Accountant, Engineer, Cashier, Scientist, Mathematician

Advanced Understanding & Activity (Alternate activity): (The student page is located in Appendix A, and the Primary Project Planner is located in Appendix B.)

Students may choose one activity to complete.

Activity 1: Math and Literature Project

Students will use the template below to complete a project demonstrating their understanding of math patterns in place value.

Student Instructions: Read the book, Anno's Mysterious Multiplying Jar. Paying special attention to the patterns in the book as well as the story structure. After reading, create your own version of the book using a pattern that explains that a multi-digit whole number represents one hundred times what it represents two places to its right. You may use any of the formats listed under "Final Project" to share your story.

Name of Book: _____

Author: _____

Math Concepts found in book: _____

Math Misconceptions: _____

Questions to research: _____

Final Project will be

- | | | | | |
|--------|---------------|----------------------|-------------|---------------|
| Poster | PowerPoint | Comic Strip | New Story | Rewrite Story |
| Report | Song | Play or Skit | Editorial | Commercial |
| Speech | Urgent E-mail | Instructional Manual | Other _____ | |

Project Deadline: _____

Resources: Must use at least two primary sources

Books:

Magazines:

Web sites:

Videos

Activity 2: A Number by Any Other Name...

Student Instructions: Fill in the missing information in the table below, expressing numbers as totals, as powers of ten, and in expanded notation.

Total	Power of Ten	Expanded Notation	
70	7×10^1	$7 \times (10)$	7×10
	7×10^2	$7 \times (10 \times 10)$	7×100
		$7 \times (10 \times 10 \times 10)$	7×1000
			7×10000
	7×10^5		
		$7 \times (10 \times 10 \times 10 \times 10 \times 10)$	
70000000			

Literature Connections/Resources:

- Mitsumasa, Anno. Anno's Mysterious Multiplying Jar. NY: Penguin Putnam Books for Young Readers. 1999.
- Burns, Marilyn. Spaghetti and Meatballs for All. NY: Scholastic Books. 2008.
- Calvert, Pam. Multiplying Menace: The Revenge of Rumpelstiltskin. Watertown, MA: Charlesbridge Publishing. 2006.

ACCRS: 4.7

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols to record the results of comparisons.

Mastered:

Students can read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Students can compare two multi-digit numbers based on meanings of the digits in each place using $>$, $=$, and $<$ symbols to record the results of comparisons.

Present:

Students will read and write multi-digit whole numbers and decimals using base-ten numerals, number names, and expanded form. Students will compare two multi-digit numbers using decimals based on the meanings of the digits in each place using $>$, $=$, and $<$ symbols to record the results of comparisons.

Going Forward:

Students will perform their skits, poems, or songs, or share other products with classmates.

Present and Going Forward Vocabulary:

Greater than, less than, equal to, decimals, tenths, hundredths, expanded form

Career Connections:

Baker, Statistician, Data-Base Administrator, Nurse

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)**I CAN...**

Student Instructions: Choose one or more activities to complete. Research your topic in order to develop the products. You may want to plan your project using the Project Planner located in Appendix A.

- Write a skit about two numbers fighting about which one is more. Have them solve the problem by using what they have learned about place value.
- Write a poem or song about how to know which number is the largest and/or which number is the smallest.
- Draw a picture to explain to younger children how to use place value to figure out what order numbers should go in if they are being placed in greatest to least order.
- Make a brochure on how to use the $>$, $=$, and $<$ symbols and tell about their importance.
- Write an authentic story problem about the lunchroom, using $>$, $=$, and/or $<$.
- Make an Important Book about place value. (Template for the *Important Book* is located in Appendix A)

Literature Connections/Resources:

Wise-Brown, Margaret. *The Important Book*. NY: Scholastic Books. 1977.

ACCRS: 4.8

Use place value understanding to round multi-digit whole numbers to any place.

Mastered:

Students can use place value to understand rounding multi-digit whole numbers to any place.

Present:

Students will use place value to understand rounding a number in the tenths place to a whole number.

Going Forward:

Students will use place value to understand rounding a number with decimals to any place or a whole number.

Present and Going Forward Vocabulary:

Place value, rounding, tenths, ones, tens, hundreds, thousands

Career Connections:

Chemist, Pharmacist, Athlete, Bookkeeper

Advanced Understanding & Activity (Alternate activity): (Student page is found in Appendix A.)

RAFTs

Student Instructions: Research how changing the place of the decimal point can change the number to make it larger or smaller and how to round off numbers with decimals to the nearest whole number. Then complete at least one of the RAFTs below.

Role	Audience	Format	Topic
Number in Tenths Place	Whole Number	Skit	“It’s Time for a Change”
Number in Tens Place	Number in Ones Place	Advertisement	“ Be All that You Can Be”
Number in Hundreds Place	Number in Thousands Place	Rap Song	“I Think we are Growing”
Whole Number in a Mixed Decimal	Its Decimal	Country Song	“It’s Round-up Time”
Decimal	Whole Number	Poem	“You Make Me Whole”
Number in the Millionth Place	Number in the Ones Place	How-to Manual	“So You Want to be a Millionaire”!
Number in the Ones Place	Number in the Hundredths Place	Mime	“It’s a Small, Small World”

Literature Connections/Resources:

- Adler, David. *Fractions, Decimals, & Percents*. NY: Holiday House. 2011.
- Stewart, David. *Sir Cumference & All the King’s Tens: A Math Adventure*. Watertown, MA: Charlesbridge Publishing. 2009.
- Tang, Greg. *Math Potatoes: Mind-Stretching Brain Food*. NY: Scholastic Publishing. 2005.
- National Library of Math Manipulatives: Decimals
http://nlvm.usu.edu/en/nav/frames_asid_264_g_2_t_1.html?from=topic_t_1.html
- National Library of Math Manipulatives: Place Value Number Line
http://nlvm.usu.edu/en/nav/frames_asid_334_g_2_t_1.html?from=grade_g_2.html
- Soccer Math at Math play.com: Rounding decimals to the nearest whole number
<http://www.math-play.com/rounding-decimals-game-1/rounding-decimals-game.html>

ACCRS: 4.9

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Mastered:

Students can fluently add and subtract multi-digit whole numbers using the standard algorithm.

Present:

Students will fluently add and subtract multi-digit numbers including decimals using any method they know.

Going Forward:

Students will identify patterns in decimals according to place value.

Present and Going Forward Vocabulary:

Decimal, decimal point, tenths, hundredths, whole numbers, place holder

Career Connections:

Owner, Cashier, Insurance Adjuster, Travel Agent

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

Students may choose one activity to complete.

Activity 1: Dream Vacation

Time required- two class periods.

Student Instructions: Read the Scenario and solve the problem, acting as a professional working in the field of travel agent.

SCENARIO: You are the manager of a travel agency, Dream Vacations on a Budget. Your client has ordered a dream vacation on a budget of \$1000.00.

- Plan the vacation, including transportation, food, lodging, and entertainment- all while staying on budget.
- Create an itinerary and an itemized statement using the templates provided.
- In addition, provide the client with an advertising brochure about the vacation destination and all of the dreamy vacation activities available, restaurants, and alternate accommodations. **Include a price list in your brochure, just in case the customer decides to venture a bit off the budget.**

Activity 2: Mind Your Place

Student Instructions:

- Watch the Khan Academy videos listed. Then complete the following table to show what happens when you change the position of the place holder in a decimal.
 - <http://www.khanacademy.org/math/arithmetic/decimals/v/decimal-place-value>
 - <http://www.khanacademy.org/math/arithmetic/decimals/v/multiplying-a-decimal-by-a-power-of-10>
 - <http://www.khanacademy.org/math/arithmetic/decimals/v/dividing-a-decimal-by-a-power-of-10>
- Complete the table by placing the decimal points in the correct places according to the heading in each column. Start with the **original number** each time you multiply or divide by a power of 10. Do this as mental Math, as seen in the Khan Academy videos. The first row is completed for you.

Original Number (10 ⁰)	Multiply by 10 (10 ¹)	Multiply by 100 (10 ²)	Multiply by 1000 (10 ³)
154.12	154.12=1541.2	154.12 = 15412	*154.12 0 = 154120
60,672.25			
771.45		77,145	
	267.12		
100.111			
			538.768
		36.214	
2,088.1			
8.780			

Hint: Start with the original number FIRST.

Red = Move decimal point to the right.

* May add a 0 at the end of a decimal without changing the value of the number.

Original Number (10 ⁰)	Divide by 10 (10 ⁻¹)	Divide by 100 (10 ⁻²)	Divide by 1000 (10 ⁻³)
154.12	154.12= 15.412	154.12 = 1.5412	154.12 = .15412
60,672.25			
771.45			
	267.12		
100.111			
	2345.67		
388.0		3.880	
2,088.1			
8.780			

Hint: Find the original number FIRST.

Blue = Move decimal point to the left.

Can you detect a pattern when multiplying or dividing by powers of 10? What is the rule? Write it below.

Activity 3: What would You Get? To Trade or not to Trade Game Show

Student Instructions: Make a list of cash prizes and offer to trade cash for a power of ten times each amount. A partner will decide whether to trade or not to trade for the new cash amount after calculating how much money the trade would be worth.

Example: You have won \$500. The host of the game show offers to trade you \$500 for (10⁻¹) times that amount. What would you say? Why? (Try to think of something clever to say if the host offers you a trade that would not be in your favor.)

Film or record the game show, if you wish.

Literature Connections/Resources:

- Chisambo, Annie. *How to Budget Your Pocket Money*. UK: Dormouse Press. 2012.
- Lopresto, Angeline. *A Place for Zero: A Math Adventure*. Watertown MA: Charlesbridge Publishing. 2005.
- McGilian, Jamie. *The Kid’s Money Book: Earning, Saving, Spending, Investing, Donating*. NY: Sterling Publishing. 2004.
- Teague, Mark. *How I Spent my Summer Vacation*. NY: Dragonfly Books. 1997.
- Patterns of Place Value with Decimals: Khan Academy
<http://www.khanacademy.org/math/arithmetic/decimals/v/decimal-place-value>
- Multiplying a decimal by a power of ten: Khan Academy
<http://www.khanacademy.org/math/arithmetic/decimals/v/multiplying-a-decimal-by-a-power-of-10>
- Dividing a decimal by a power of ten: Khan Academy
<http://www.khanacademy.org/math/arithmetic/decimals/v/dividing-a-decimal-by-a-power-of-10>

ACCRS: 4.10

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Mastered:

Students can multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers.

Present:

Students will multiply a whole number of up to four digits by a two-digit or three-digit whole number.

Going Forward:

Students will be able to multiply a whole number of up to four digits by a four-digit whole number.

Present and Going Forward Vocabulary:

Multiple, multiply, jargon, meteorologist

Career Connections:

Chef, Stock Broker, Computer Programmer, Sports Statistician, Sports Announcer, Meteorologist

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A, and the Primary Project Planner is located in Appendix B.)

Students may choose one activity to complete.

Activity 1: Roll Tide, War Eagle

Student Instructions: Read the scenario and work through the problem, acting as a professional in the field of sports reporting.

SCENARIO: Assume the role of a sports announcer for the Alabama vs. Auburn football game.

- Use multiplication to determine the number of total yards passing by both quarterbacks and compare their performances. Multiply two-digit numbers by three-digit numbers as part of the scenario.
- Explain why you need to do this and what information you learned.
- Also decide what kind of math to do to compare the passing yards gained by these two quarterbacks. Include the mathematical reasoning in your scenario.
- Record the accounts as part of a “radio show” game review or draw a picture to illustrate your sports report. Remember to think like a disciplinarian (sportscaster in this case), and use the specific language or jargon of the discipline in your sports report.

Activity B: Storm Watchers

Student Instructions: Read the scenario and work through the problem, acting as a professional in the field of meteorology.

SCENARIO: Acting as meteorologists, you will “research” the details of a simulated severe storm that ripped through your town.

- Write a multiplication word problem about a severe storm that ripped through your town. The problem must use either a three-digit or two-digit number as a factor, multiplied by a two or three-digit number. Include the answer.
- Create a cartoon of the story behind the math. Think like a disciplinarian (meteorologist in this case), and use the specific language or jargon of the discipline in your cartoons. Or you may choose to broadcast or record a weather report in which you explain the details of the storm which includes the math behind the story.

Literature Connections/Resources:

- Calvert, Pam. Multiplication Menace: The Revenge of Rumpelstiltskin- A Math Adventure. Watertown, MA: Charlesbridge Publishing. 2006.
- Furgang, Kathy. National Geographic Kids Everything Weather: Facts, Photos, and Fun that will Blow You Away. Washington, DC: National Geographic Children’s Books. 2012.
- Goin, Meriam. National Geographic Readers: Storms! Washington, DC: National Geographic Children’s Books. 2009.
- Scieska, Jon. Math Curse. NY: Viking Juvenile Publishing. 1995.

ACCRS: 4.11

Find whole-number quotients and remainders with up to four-digit dividends and one-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.

Mastered:

Students can find whole number quotients and remainders with up to four-digit dividends and one-digit divisors.

Present:

Students will find whole number quotients and remainders with up to four-digit dividends and two-digit divisors.

Going Forward:

Students will be able to find quotients and remainders with whole numbers and decimals.

Present and Going Forward Vocabulary:

Quotients, remainders, dividends, divisors, voucher, debit, balance

Career Connections:

Accountant, Teacher, Pharmacist

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A, and the Primary Project Planner, is located in Appendix B.)

Students may choose one activity to complete.

Activity 1: Math and Literature:

Student Instructions: Read Safari Park by Stuart Murphy. While reading, look for division problems and note how they are solved. Then write a book about a trip to Disney World following the pattern of division from Safari Park. All quotients must have remainders, up to four-digit dividends, and at least two-digit divisors.

Activity 2: Safari Park Adventure

Student Instructions: Go to the Web site: www.sdzsafaripark.org/planyourtrip/map.html and plan a trip to visit the San Diego Zoo Safari Park.

SCENARIO:

For your birthday, your parents have given you a ticket to visit the San Diego zoo and spend some time in Safari Park. They insisted that you must plan the trip yourself. These are the conditions.

- You are allowed 5 1/2 hours at the park each day.
- You have only 3 days to see all of the shows and participate in as many safaris as you can afford.
- You have \$375 in safari vouchers.

Plan your daily visits, dividing your time and money among the activities.

1. Submit a budget to show how you will spend your money.
2. Create a schedule to show your proposed plan.
3. Make a list of the possible problems that might interfere with your trip.

Literature Connections/Resources:

- Murphy, Stuart. Safari Park. NY: HarperCollins. 2001.
- “Remainders” Game” from K-5 Math Teaching Resources at: <http://www.k-5mathteachingresources.com/support-files/remainders.pdf>

ACCRS: 4.12

Explain why a fraction a/b is equivalent to a fraction $(nxa)/(nxb)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Mastered:

Students can explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{nxa}{nxb}$ by using visual fraction models with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principal to recognize and generate equivalent fractions.

Present:

Students will apply their knowledge of fractions to solve an equivalent fraction challenge.

Going Forward:

Students will create a story book about the challenge solved, to teach others about equivalent fractions.

Present and Going Forward Vocabulary:

Fraction, numerator, denominator, equivalent

Career Connections: Conservationist, Teacher
Carpenter, Construction Worker, Chef, Machinist, Seamstress,
Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)**Activity: Fraction Problem Solving: Can You Help the King of Fractionland???**

Student Instructions: The King of Fractionland needs your help. Before you can help, you will need to investigate equivalent fractions with pattern blocks, answering the following questions:

1. How many green triangles are in one blue rhombus? _____
2. How many green triangles are in one red trapezoid? _____
3. How many green triangles are in one yellow hexagon? _____
4. How many blue rhombi are in one yellow hexagon? _____
5. How many red trapezoids are in one yellow hexagon? _____

Student challenge...

Part 1: The King of Fractionland has three children- two boys and one girl- to whom he would like to give his kingdom. He would like to give $1/3$ of the kingdom to each of his sons and $4/6$ to his daughter. Using pattern blocks, decide if the King can do this. Then explain your answers in words.

Part 2: Now, develop plans for other ways the king can split his kingdom among the children. Shares do not have to be equal.

Part 3: When finished, create a storybook about the King of Fractionland and how he finds a good way to split the kingdom among his children. Your stories should help others understand equivalent fractions.

Materials Needed: Set of pattern blocks

Literature Connections/Resources:

- McGrath, B. B. *Skittles Riddles math*. Watertown, MA: Charlesbridge Publishing. 2000.
- Adler, D.A. *Fraction fun*. NY: Holiday House. 1996.
- Pattern Block Puzzles at http://nlvm.usu.edu/en/nav/frames_asid_170_g_2_t_3.html?open=activities&from=category_g_2_t_3.html

ACCRS: 4.13

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators or by comparing to a benchmark fraction such as $\frac{1}{2}$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Mastered:

Students can compare two fractions with different numerators and different denominators and recognize that comparisons are valid only when the two fractions refer to the same whole, then record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions.

Present:

Students will apply their knowledge of comparing fractions to play a game against other students across the country on Fraction Feud at www.CalculationNation.com

Going Forward:

Students will create their own game that requires students to compare fractions with unlike denominators.

Present and Going Forward Vocabulary:

Fraction, denominator, numerator, common denominator, greater than, less than, equal to

Career Connections:

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

Calculation Nation – Fraction Feud

Student Instructions: Sign up for an account at www.calculationnation.com or use a “Guest Pass” to play. This website allows you to play challenging math games with students all over the U.S. In order to create an account, you must enter an email address. However, this email address does not have to be a real email, it just needs to be in an email address format. No emails will ever be sent, and the program never checks to see if the email account works. Once the account is set up, begin exploring the game entitled Fraction Feud.

- **Object:** Create a fraction that is larger (or smaller) than your opponent’s fraction.
- **Set-Up:** A game consists of two battles, and each battle contains five jousts. Each player is given 12 cards before the first battle. Two cards are used in each joust, so each player will have two cards remaining at the end of the first battle. An additional 8 cards will be given to each player before the second battle.
- **Play:** In each joust, you will use two cards to create a fraction — one card will be the numerator, the other will be the denominator. In the first, third and fifth jousts of a battle, you will attempt to create a smaller fraction than your opponent. Points are earned if you make a smaller or equivalent fraction. In the second and fourth jousts of a battle, you will try to create a larger fraction. Points are earned if you make a larger or equivalent fraction.
- **Winning the Game:** The winner is the player with more points when the last joust of the second battle is completed.

Going Forward: Create your own comparing fractions game.

Student directions: Now that you have had ample practice playing this game of comparing fractions, design your own comparing fractions game.

This game could be a board game, card game, or interactive game created with PowerPoint or another software program.

Give a short description of your game and write a set of rules so others can play.

Be ready to share your games with other students when finished.

Literature Connections/Resources:

- Calculation Nation Fraction Feud at <http://www.calculationnation.com/Games/Game.aspx?GameId=791A122F-BFCB-4B10-9DEC-217D5Aafb6af>
- Pallotta, Jerry. *Hershey Fractions*. NY: Scholastic. 1999.

ACCRS: 4.14

Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

- a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.
Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$
- c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Mastered:

Students understand basic fractions concepts and can add/subtract with like denominators, solve word problems, find equivalent fractions, and understands the relationship between fractions, decimals, and percentages.

Present:

Students will model this knowledge through creation of a RAFT project.

Going Forward:

Students will demonstrate their understanding of fractions by presenting their RAFT project to the class.

Present and Going Forward Vocabulary:

Fraction, denominator, numerator, common denominator, greater than, less than, equal to, decimal, improper fraction, mixed number, equivalent

Career Connections:

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)

RAFT

Students Instructions: Choose one row. Research and write about the TOPIC from the perspective of the ROLE to the AUDIENCE using the FORMAT. Your product should reflect your understanding of the concepts about which you are communicating. You may want to plan your product using the organizational tool, Primary Project Planner found in Appendix B.

<u>ROLE</u>	<u>AUDIENCE</u>	<u>FORMAT</u>	<u>TOPIC</u>
Whole Number	Fraction	Cartoon strip	“Help! I’m breaking up, I’m breaking up!”
Fraction	Whole Number	Children’s book	“I just want to be a part.”
Decimal	Its Fractional Equivalent	Invitation and Mask	“Come to the Masquerade Ball!”
Fraction	Equivalent Fraction	Wanted Poster	“Identity Theft!”
Numerator	Denominator	Country Song	“I’m All Hung up over You”
Percentage	Decimal	Square Dance and Call	“Swing Your Partner”

Literature Connections/Resources:

- Adler, David. *Fractions, Decimals, & Percents*. NY: Holiday House. 2011.
- Gifford, Scott. *Piece=Part=Portion*. Berkley, CA: Tricycle Press. 2008.
- Pallotta, Jerry. *Hershey Fractions*. New York: Scholastic. 1999.
- Walton, Rick. *Noah’s Square Dance*. NY: HarperCollins Publishers, 1995.

ACCRS: 4.15

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- a. Understand a fraction a/b as a multiple of $1/b$.

Example: Use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.

- b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.

Example: Use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (nxa) / b$.)

- c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.

Example: If each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between which two whole numbers does your answer lie?

Mastered:

Students can apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- a. Understand a fraction a/b as a multiple of $1/b$.

Example: Use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.

- b. Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.

Example: Use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (nxa) / b$.)

- c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.

Example: If each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between which two whole numbers does your answer lie?

Present:

Students will apply their knowledge of multiplying a fraction by a whole number to solve a problem from a fraction story.

Going Forward:

Students will use the same story book to create more fraction problems that involve multiplying fractions by whole numbers.

Present and Going Forward Vocabulary:

Fraction, numerator, denominator, multiplication

Career Connections:

Carpenter, Construction Worker, Chef, Machinist, Seamstress,
Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)**Full House Fractions Stories**

Student Instructions: Read the book, Full House: An Invitation to Fractions by Dayle Ann Dodds. Then answer the question below.

When preparing her scrumptious dinner, Miss Bloom prepared $\frac{2}{3}$ of a pound of potatoes and $\frac{6}{8}$ of a pound of chicken drumsticks for each person. How many pounds of potatoes did Miss Bloom cook? How many pounds of chicken drumsticks? Explain your thinking. Use a visual fraction model and an equation to represent each problem.

Now it is your turn to create. Use situations in the story to create your own fraction story problems. Use a fraction model to illustrate your problem and express it as an equation. Then solve, but do not put your answers next to the problems. Make an answer key on the back of your paper. Ask your teacher to laminate your problems and put them in a central place in the classroom for friends to solve.

Literature Connections/Resources:

- Dodds, Dayle Ann. Full House: An Invitation to Fractions. Somerville, MA: Candlewick Press. 2009.
- Shaskan, Speed. If I Were a Fraction. NY: Greenwillow Books. 2008.

ACCRS: 4.16

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.)

Example: Express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.

Mastered:

Students can understand basic fraction concepts and can add/subtract with like denominators, solve word problems, find equivalent fractions, and understand the relationship between fractions, decimals, and percentages.

Present:

Students will model this knowledge through creation of brief projects from the Fractions Tic-Tac-Toe activity sheet.

Going Forward:

Students will demonstrate their understanding of fractions by presenting their projects to their peers.

OR: Students will make their own infographic to share with peers

Present and Going Forward Vocabulary:

Fraction, denominator, numerator, common denominator, greater than, less than, equal to, decimal, improper fraction, mixed number, equivalent

Career Connections:

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

TIC-TAC-TOE Menu

Student Instructions Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE.

Complete the contract to give to your teacher. You may want to plan your products using the organizational tool, Primary Project Planner.

<p>1. Math Dictionary Create a Math Dictionary for terms related to fractions, decimals, and percentages. You must include at least 12 words in your dictionary and use words as well as pictures to illustrate the definitions.</p>	<p>2. Simplest Form Choose a fraction that is in its simplest form. Make 15 new equivalent fractions.</p>	<p>3. Conduct a Survey Design a survey and then poll at least 20 friends. Display your data as fractions, decimals, and percents.</p>
<p>4. How-to Poster Design a poster that illustrates how to convert decimals to fractions and fractions to decimals.</p>	<p>5. Information Please! Look at the Infographic at the link below: https://getschooled.com/attendance-research Or ask your teacher to download and print the poster.</p> <ul style="list-style-type: none"> • Make a list of the many, varied sub-topics addressed. • Why did the graphic designer use percentages rather than fractions or decimals to share these data? • What is the most important information you learned by studying this Infographic? • Why is that information important to know? 	<p>6. Real Life Math Find 10 real life examples of Fractions, Decimals, and Percentages. Take photos of these real life uses and create a scrapbook of the numbers. Make a statement about how each helps in understanding something. Put it in your scrapbook next to the figure/s.</p>

<p>7.</p> <p>Fractions & Money</p> <p>Draw a dollar bill. Divide the dollar bill into $\frac{4}{4}$. Tell how many cents each fourth of the dollar represents. Repeat by dividing the bill into $\frac{5}{5}$, $\frac{10}{10}$, and $\frac{20}{20}$, showing how many cents each fractional part represents.</p>	<p>8.</p> <p>Same but Different</p> <p>On the student page found in Appendix 2, complete the Venn diagram about fractions and decimals. Then brainstorm occasions when it would be more appropriate to express a number using a fraction than a decimal and vice-versa.</p>	<p>9.</p> <p>Be the Teacher</p> <p>Design a study guide that reviews what a student needs to know about determining equivalent forms of fractions, decimals, and percents. Include some practice problems and an answer guide.</p>
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Literature Connections/Resources:

- Murphy, Stewart. Jump, Kangaroo, Jump. Wilmington, MA: Great Start Publishing. 1999. Pallotta, Jerry. Hershey Fractions. NY: Scholastic. 1999.
- Pallotta, Jerry. Apple Fractions. NY: Cartwheel Publishing. 2002.
- Source of infographic for #5, "Information Please"! <https://getschooled.com/attendance-research>
- How to make an infographic at: <http://ivancash.com/Infographic-of-Infographics>
<http://www.1stwebdesigner.com/freebies/free-online-tools-create-diagrams/>

ACCRS: 4.17

Use decimal notation for fractions with denominators 10 or 100.

Example: Rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

Mastered:

Students can use decimal notation for fractions with denominators 10 or 100.
Example: Rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

Present:

Students will model this knowledge through creation of brief projects from the Fractions Tic-Tac-Toe activity sheet.

Going Forward:

Students will demonstrate their understanding of fractions by presenting their projects to their peers.

Present and Going Forward Vocabulary:

Fraction, denominator, numerator, common denominator, greater than, less than, equal to, decimal, improper fraction, mixed number, equivalent

Career Connections:

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

TIC-TAC-TOE MENU:

Student Instructions: Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE. Complete the contract to give to your teacher.

<p>1. That's a Rap! Compose a rap song explaining how to convert fractions to decimals and then to percentages. Challenge: Choreograph a dance to go with your rap song</p>	<p>2. Same but Different: You Be the Judge Use the Student Page in Appendix A to complete the Venn diagram about fractions and decimals. Then brainstorm occasions when it would be more appropriate to express a number using a fraction than a decimal and vice-versa.</p>	<p>3. Fractional Whole Search Use the student page found in Appendix A to do a Fractional Whole Find. On the student page, you may find fraction wholes by searching diagonally, vertically, or horizontally.</p>
<p>4. Convince Me! Research the history and mathematical application of metric versus English notation for measurement. Based on your research, write a persuasive letter to your congressman about the benefits of switching to the metric system that uses measurement based on powers of 10 rather than fractions as the standard of measure. OR argue the other side, that the English standard of measure using fractional and mixed numeral notation is better than metric and should be retained. (Use the template provided to help you plan your persuasive letter.</p>	<p>5. Dream House Create a dream home for an ant family. As the architect, you must include everything in the house that an ant would need to survive, as well as amenities that ants would love and that would make the home luxurious. As an architect, you will need to draw a blueprint for the house, including exact dimensions of each room. Express dimensions in decimals or whole numbers and decimals, and make your drawing to scale. Label all dimensions on the blueprint. First, do some research about ants to learn their basic needs and what they would consider to be luxurious.</p>	<p>6. Double the Fun Choose a favorite recipe or ask your mom for hers. Or you can use the recipe found at this link: http://www.myrecipes.com/recipe/red-velvet-brownies-50400000108664/ Using the on-line calculator found at http://www.online-calculator.com/, double the recipe and "write" it for someone who does not read or speak English. (Communicate by Illustrating each step instead of writing.) Challenge: Now cut the original recipe in half.</p>
<p>7. Rectangle Riddles Use color tiles, squared paper, and markers to illustrate the following riddles. <ul style="list-style-type: none">A rectangle is $\frac{3}{5}$ red.The rest is blue and yellow, but NOT in equal amounts. What could the rectangle look like?A rectangle is $\frac{1}{2}$ red and $\frac{1}{3}$ blue. Also, it has one green tile and one yellow tile. What could the rectangle look like? What fractional part is green? Yellow?Make up your own riddles like these for others to solve</p>	<p>8. Sum It Up Using the numbers 1-8, put one number in each box. Use the number only once. On your own paper, draw the equation below as many times as you need to solve the problems. $\frac{\square}{\square} + \frac{\square}{\square}$ <ul style="list-style-type: none">What is the least sum possible?What is the greatest sum possible?</p>	<p>9. Pass it On Make up a fraction and write it at the top your paper. In one minute, rename it as many ways as you can, including equivalent fractions, decimals, and percentages. Trade papers with a partner. In one minute, add more new names for the original fraction. (This time, you may also rename the fraction using addition, subtraction, multiplication, and division.) <u>Anything</u> goes as long as your answer is a new name for the original fraction! Use your imagination. Repeat with a different fraction as time permits.</p>

I/we chose activities # __, # __, and # __. Date: _____

Name: _____

Literature Connections/Resources:

- Adler, David. Fractions, Decimals, & Percents. NY: Holiday House. 2011.
- Beaty, Andrea. Iggy Peck, Architect. NY: Abrams Publishing. 2007.
- Gibbons, G. How a House is Built. NY: Holiday House. 1996.
- Laden, Nina. Roberto the Insect Architect. San Francisco: Chronical Books. 2000.
- Schwartz, David. Millions to Measure. NY: HarperCollins. 2003.

ACCRS: 4.18

Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.

Mastered:

Students can apply and extend the knowledge of comparing two decimals to hundredths by reasoning about their size, recognize that comparisons are valid only when the two decimals refer to the same whole number, and record the results of comparisons with the symbols $<$, $=$, or $>$.

Present:

Students will create a game that compares decimals using the decimals cards provided, or by creating their own decimals cards for the game.

Going Forward:

Students will teach the game to another group of students, or to a group of teachers who want to use the game in their own classrooms.

Present and Going Forward Vocabulary:

Tenths, hundredths, greater than, less than, equal to

Career Connections:

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineer, Architect

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A, and the Project Planner is located in Appendix B to help you organize your project.)

Comparing Decimals Game

Student Instructions: Read the Scenario and solve the problem as a professional working in the field of game design.

SCENARIO: Congratulations! You have been hired by an educational game company to create a game that will teach others how to compare decimals. Your job is to create a fun game that will help students learn to compare decimals. Your game should include the following components:

1. Rules and Directions: This should be typed in a creative format.
2. **Game Materials Needed:** You may create your own decimal cards or make them on the computer by following these directions:
 - Go to <http://www.senteacher.org/Worksheet/9/Number.xhtml>
 - Under “example sets”, choose “decimal quarters”
 - In the box under “Start On”, enter “0.”
 - In the box under “Steps of,” enter .123
 - Click on “Send Numbers”
 - Click on “Download” and print.
3. You may make a game board or other components for your game. Be creative!
4. Create an attractive container for your game. It needs to be exciting so others want to purchase your game.
5. Think of a clever title for your game. It should be something that grabs the interest of potential players.

When you finish with your game, teach it to a group of students or teachers. Make sure you know how to plan and explain it well!!

Good luck!

Literature Connections/Resources:

- Decimal cards and math games at:
www.senteacher.org
- Create decimal number cards at:
<http://www.senteacher.org/Worksheet/9/Number.xhtml>
 - Gifford, Scott. Piece=Part=Portion. Berkley, CA: Tricycle Press. 2008.
 - Gifford, Scott. Piece = Part = Portion: Fractions = Decimals = Percents. Berkley, CA: Tricycle Press. 2003.

ACCRS: 4.19

Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

Examples: Know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36),

Mastered:

Students can relate and express sizes of measurement units within one system of units, including km, m, cm; kg, g; lb, oz; l, ml; and hr, min, sec.

Present:

Students will convert larger units of measurement into smaller units and create comparison charts. Students can relate the importance of measurements in everyday life.

Going Forward:

Students will relate and express sizes of measurement units within more than one system of units, including metric and standard

Present and Going Forward Vocabulary:

System of measurement, length, weight, time, kg, g, km, m, l, ml,

Career Connections:

Pharmacist, Medical and Health Services Professional, Chef, Detective, Farmer, Industrial Production Manager, Surveyor, Cartographer, Actuary, Travel Agent, Real Estate Broker, Carpenter, Plumber

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

I CAN.....

Student Instructions: Choose one or more activities to complete and place a check mark in the column in front of it or them. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

	1. Create an Important Book about measurement. (Preparatory worksheet and template are located in Appendix A.)
	2. Create a podcast explaining the importance of units of measurement. First, check out an awesome example of this at the NASA Connect Web site at http://classroomclips.org/video/1444 .
	3. Translate a favorite American recipe so that a chef in Germany can prepare it. In Germany, solids such as flour, salt, sugar, etc. are measured in grams (g) and kilograms (kg). In America, we use teaspoons, tablespoons, ounces, cups, etc. The German standard of measure for liquids is milileters (ml) and liters (l). In the US, we measure liquids with teaspoons, tablespoons, cups, pints, etc. http://www.dict.cc/?s=subject%3Afood&pagenum=21 If you need an idea for a recipe, try the pear upside-down cake at this link: http://www.kraftrecipes.com/recipes/pear-upside-down-cake-118956.aspx?pf=true
	4. As a travel agent, you are planning a vacation trip for a client who wants to go to Europe. While there, the family wants to ride the train and travel to 10 towns and villages in England and France. Plan an itinerary using both American standard units of measure and metrics to show distances between the towns at which they will stop. In the itinerary, list the 10 towns, research them to find something unique about each, and give the distances to each on the train's route. Include in your itinerary the times of departure and arrival in European time. Draw a map to illustrate the route your client will take.

Literature Connections/Resources:

- Derubertis, Barbara. Lulu's Lemonade (Capacity). Minneapolis: Kane Press. 2000.
- Herman, Gail. Keep Your Distance (Length). Minneapolis: Kane Press. 2001.
- Kellogg, Steven. Jack and the Beanstalk (Length). NY: HarperCollins. 1995
- Murphy, Stuart J. A House for Birdie (Volume or Capacity). NY: HarperCollins. 2004.
- Myller, Rolf. How Big is a Foot? (Length). NY: Yearling Publishers. 1962.
- Sweeney, Joan. Me and the Measure of Things (Length, Weight, Capacity). NY: Dragonfly Books. 2002.
- Wells, Robert E. Is a Blue Whale the Biggest Thing There Is? (Size). Chicago: Allen Whitman Publishers. 1995.

ACCRS: 4.20

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Mastered:

Students can use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Present:

Students will create and solve word problems involving distance, time, volume, mass fractions and decimals as exhibited in their selection of activities on the TIC-TAC-TOE MENU.

Going Forward:

Students will be able to do Web site games on mixed fractions and measurements of three-dimensional shapes.

Present and Going Forward Vocabulary:

Volume, fraction, decimal, number line diagram, measurement scale

Career Connections:

Medical Service Providers, Surveyors, Cartographers, Budget Analysts, Purchasing Agents, Construction Managers, Meeting Convention Planners, and Biomedical Engineers

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

TIC-TAC-TOE

Student Instructions: Choose three activities in a row, column, or diagonal, just like TIC-TAC-TOE, or choose just one or two from anywhere on the grid. Complete the contract to give to your teacher. You may want to plan your products using the organizational tool, Primary Project Planner.

<p>1. Football Fantasy Design a football stadium that uses a new playing field that is measured in something besides yards.</p>	<p>2. Be the Author As a famous mystery writer, you have decided to author a story where a character has to convert units of measurement in order to solve a mystery. Decide the plot of the mystery, choose the units of measure to be converted, do the math, and write the story.</p>	<p>3. And the Survey Says... Conduct a survey of 20 students and create a graph to compare their preferences among doing Math with problems that involve fractions, decimals, or measurement.</p>
<p>4. Distance Yourself Write 5 word problems that use the four operations that involve distance.</p>	<p>5. Fraction Game Review Research and find a Web site that has a fraction game. Play the game and write a critique of the game for your teacher. In your critique, include the following:</p> <ul style="list-style-type: none"> • The name of the game • A link to the Web site where it can be found • The purpose of the game • A summary of how it is played • Your opinion of its effectiveness in teaching what is was intended to teach • The “degree” of fun • A recommendation for who else in your classroom might enjoy playing the game and why. 	<p>6. Times in the News Find an article in the newspaper or on the web about which you can write a word problem about time intervals. Write a summary of the article and your math problem.</p>
<p>7. Jobs, Jobs, Jobs Make a list of 3 careers that involve volumes and masses of objects. Choose one and use the student page to help you research your choice of the 3 careers.</p>	<p>8. A Measure by Any other Name... Create an acrostic for the word “measurement.”</p>	<p>9. Rappin’ It Up Write a rap song about one of the following topics: volume, mass, fraction, decimal, time, distance, or money.</p>

Literature Connections/Resources:

- Pluckrose, Arthur Henry. Knowabout: Capacity. Danbury, CT: Franklin Watts. 1988.
- Adler, David. How Tall, How Short, How Far Away? (Length). NY: Holliday House. 2000.
- Long, Lynette. Measurement Mania: Games and Activities. Hoboken, NJ: Wiley Publishing. 2001.
- Murphy, Stuart. Mighty Maddie (Weight). NY: HarperCollins. 2004.
- Murphy, Stuart. Polly's Pen Pal (Length, Weight). NY: HarperCollins. 2005.
- Murphy, Stuart. Racing Around (Length). NY: HarperCollins. 2002.

- Murphy, Stuart. Room for Ripley (Capacity). NY: HarperCollins. 1999.
- Murphy, Stuart. Super Sand Castle Saturday (Non-standard Measurement). NY: HarperCollins. 1998.

ACCRS: 4.21

Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

Example: Find the width of a rectangular room given the area of the flooring and the length by viewing the area formula as a multiplication equation with an unknown factor.

Mastered:

Students can apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

Present:

Students will design cakes and measure the volume of these to design packaging for them. They can also calculate price for ingredients.

Going Forward:

Students will be able to make a spreadsheet that helps to calculate materials and costs for baking or other production costs activities.

Present and Going Forward Vocabulary:

Rectangle, area, length, width, formula, factor

Career Connections:

Gardener, Landscape Designer, Packaging Engineer, Aerospace Engineer, Carpenter, Construction Worker, Furniture Designer, Architect, Civil Engineer, Emergency Management Agent, Farmer, Criminal Investigator, Real Estate Agent, Shipping Agent

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)

Cake Conundrum

Student Instructions: Read the scenario and solve the problem.

SCENARIO: You work for the Cake Boss, who has given you a task to complete. You must make three crazy cakes for three crazy celebrations. Each cake must have three tiers.

- Draw a picture of each cake and tell how much cubic area each cake will have.
- Explain in words or in numeric formula how the area of each tier is related to the total cubic area of the cake.
- Tell how many guests the cakes will serve.
- Design a box in which to put your cake for delivery- Put the dimensions on the box and tell what its volume will be.
- Finally, calculate how much the ingredients are going to cost for each cake.
- Submit your plans to the Cake Boss when you are done.

Literature Connections/Resources:

- Clement, Rod. *Counting on Frank*. NY: Houghton-Mifflin. 1994.
- Leedy, Loreen. *Measuring Penny*. NY: Square Fish Publishing. 2000.
- Schwartz, David. *Millions to Measure*. NY: HarperCollins. 2006.

ACCRS: 4.22

Make a line plot to display a data set of measurements in fractions of a unit ($1/2, 1/4, 1/8$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Example: From a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Mastered:

Students can make a line plot to display a data set of measurements in fractions of a unit ($1/2, 1/4, 1/8$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Present:

Students will complete one or more of the I CAN activities to demonstrate their understanding of fractions and line plots

Going Forward:

Students will create graphs on excel to demonstrate their understanding of line plots.

Present and Going Forward Vocabulary:

Line plot, data set, measurement, fractions

Career Connections:

Biologist, Medical Research Scientist, Statistician, Zoologist, Animal Researcher, Community Planner, Advertising Agent

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)

I Can.....

Student Instructions: Choose one or more activities to complete. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

	1. Create frequency tables for the ages and birthdays of your classmates.
	2. Make a video that explains what a line plot is and how to create one. Share your video with the class and your math teacher.
	3. Design an experiment that uses data that can be recorded in fractions. Use a line plot to record your data.

Literature Connections/Resources:

- Greenberg, Dan. Funny and Fabulous Fraction Stories (Grades 3-6). NY: Scholastic Teaching Resources. 1999.
- Hutchins, Pat. The Doorbell Rang. NY: Greenwillow Books. 1994.
- McMillan, Bruce. Eating Fractions. NY: Scholastic Books. 1993.
- Pallotta, Jerry. Apple Fractions. NY: Cartwheel Books. 2003.

ACCRS: 4.23

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.

- An angle is measured with reference to a circle with its center at the common endpoint of the rays by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through $1/360$ of a circle is called a “one-degree angle” and can be used to measure angles.
- An angle that turns through n one-degree angles is said to have an angle measure of n degrees.

Mastered:

Students can recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.

Present:

Students will play and then evaluate games about angles and geometric shapes.

Going Forward:

Students will design original games about geometry using the programming software at www.scratch.com.

Present and Going Forward Vocabulary:

Angle, geometric shape, ray, endpoint, arc, intersect, one-degree angle

Career Connections:

Carpenter, Architect, Fashion Designer, Civil Engineer, Landscape Designer, Interior Decorator

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A.)**What’s Your Angle?....**

Student Instructions:

- Play the three web games listed below.
 - <http://www.xpmath.com/forums/arcade.php?do=play&gameid=78>
 - <http://www.xpmath.com/forums/arcade.php?do=play&gameid=74>
 - <http://www.xpmath.com/forums/arcade.php?do=play&gameid=75>
- Now you are the game designer. Design your own original game that will help students to understand angles. Include:
 - A clear objective for your game
 - Illustrations
 - Thorough instructions on how to play the new game
 - Necessary computer requirements, such as software, RAM, etc.
 - Ages of kids who would benefit from your game.
 - A clever title

You may find the following Web sites helpful as you design your game.

 - www.scratch.com
 - <http://pbskids.org/stemchallenge/>
- Go to the link and scroll down the page past the videos.
- Write a letter to the Web Site Developers and tell them about your game. Be enthusiastic in order to “sell” them on the idea of marketing it. Impress them with your knowledge of the business by using the

language of the discipline (a video game designer) as you write.

Literature Connections/Resources:

- Adler, David. *Shape Up!: Fun with Triangles and Other Polygons*. NY: Holiday House. 1998.

- Burns, Marilyn. The Greedy Triangle. NY: Scholastic. 1995
- Hoban, Tana. Shapes, Shapes, Shapes. NY: Greenwillow Books. 1996.
- Hoban, Tana. Cubes, Cones, Cylinders, & Spheres. NY: Greenwillow Books. 2000.
- Long, Lynette. Groovy Geometry: Games and Activities that Make Math Fun and Easy. Hoboken, NJ. John Wiley & Sons. 2003.
- Murphy, Stuart. Captain Invincible and the Space Shapes. NY: HarperColins. 2001.
- Neuschwander, Cindy. Mummy Math: An Adventure in Geometry (3-D Shapes). NY: Henry Holt & Co. 2005.
- Sande, Warren & Sande, Carter. Hello World! Computer Programming for Kids and Other Beginners. Shelter Island, NY. 2009.
- How to Design a Video Game at <http://pbskids.org/stemchallenge/>
- Video game development software: www.scratch.com

ACCRS: 4.24

Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

Mastered:

Students can measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

Present:

Students will complete the I CAN activity and demonstrate their knowledge of degrees and angle measurement.

Going Forward:

Students will design art such as tessellations in the computer using MSPaint.

Present and Going Forward Vocabulary:

Angle, degrees, protractor

Career Connections:

Carpenter, Cartographer, Aerospace Engineer, Landscape Architect, Surveyor, Drafter. Detective, Artist, Video Game Designer

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)**I CAN.....**

Student Instructions: Choose one or more activities to complete. Circle the ones you choose. Research your topic in order to develop the products. You may want to plan your project using the Project Planner.

1. Write a review of the protractor videos and games below:

<http://www.amblesideprimary.com/ambleweb/mentalmaths/protractor.html>

<http://www.ezscool.com/Games/Angles.html>

<http://www.mathplayground.com/measuringangles.html>

Go to each Web site, explore the games and videos, use the template provided in the Student Pages to organize your critique, then write the review and submit it to your editor (teacher).

2. Research how to make a film canister kaleidoscope. Make one and film the steps to make a how-to video for your teacher and classmates.
3. Design and draw a Rube Goldberg device that has a different angle in the pathway to each object. See one at the Rub Goldberg Web site at:
<http://www.rubgoldberg.com/>
4. Create a comic strip about angles.
5. Research the importance of quilting to the Northern Plains Native Americans in the late nineteenth century. Design a Star quilt pattern and write a short paragraph about the geometry in your quilt. Also explain what the colors in your quilt symbolize.
6. Research and make a slide show about tessellations that include these terms: tessellation, polygon, angle, plane, vertex and adjacent. Create your own tessellation and explain what geometric shapes were used and the measurement of the angles in your tessellation. Explain whether your creation is a regular or irregular tessellation. Begin your research by checking out the Web sites below.
 - Explanation of tessalations and how to make them at:
 - <http://www.coolmath4kids.com/tesspag1.html>
 - PBS video explaining how to tessellate, "Can't Wait to Tessellate:"
<http://pbskids.org/go/video/?category=games&pid=GAxe3o2eW6an1bQMncVuhuRbxdivIcCeh>

Literature Connections/Resources:

- Briggs, Raymond. *Jim and the Beanstalk*. London: Puffin Books. 1997.
- Boswell, Thom. *The Kaleidoscope Book: A Spectrum of Spectacular Scopes to Make*. NY: Sterling Publishing. 1995.
- Bennett, Carolyn & Romig, Jack. *The Kids' Book of Kaleidoscopes*. NY: Workman Publishing Co. 1994.
- Seymore, Dale & Britton, Jill. *Introduction to Tessellations*. Lebanon, IN: Dale Seymore Publications. 1990.
- Paul, Ann Whitford. *Eight Hands Round: A Patchwork Alphabet*. NY: HarperColins. 1996.
- Explanation of tessalations and how to make them at:
<http://www.coolmath4kids.com/tesspag1.html>
- PBS video explaining how to tessellate, "Can't Wait to Tessellate:"
<http://pbskids.org/go/video/?category=games&pid=GAxe3o2eW6an1bQMncVuhuRbxdivIcCeh>
- Rube Goldberg Web site at:
<http://www.rubgoldberg.com/>

ACCRS: 4.25

Recognize angle measure as additive. When an angle is decomposed into nonoverlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real-world or mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Mastered:

Students can recognize angle measure as additive; when an angle is decomposed into nonoverlapping parts, the angle measure of the whole is the sum of the angle measures of the parts, and solve addition and subtraction problems to find unknown angles on a diagram in real-world or mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Present:

Students will demonstrate how to solve unknown angle measures by participating in activities on the THINKFAST student page.

Going Forward:

Students will be able to use a compass and protractor to create art by measuring and creating circles and triangles.

Present and Going Forward Vocabulary:

Angles, diagram, symbol, sum, measure, degrees

Career Connections:

Farmer, Construction Manager, Builder, Aerospace Engineer, Packaging Engineer, Bridge Builder, Cartographer, Surveyor, Drafter, Carpenter

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)

THINKFAST....

Student Instructions: Follow the directions at each letter. Write your answers as quickly as possible on a separate piece of paper. How many of these can you complete?

A	Name at least 5 things that have <u>angles</u>
N	Make up a word problem about angles that has the letter <u>N</u> as the answer.
G	Give a survey about angles and create a <u>graph</u> .
L	<u>List</u> careers that might have to know about angles.
E	Create a work of art that has 5 different angles in it and the subject is an object that starts with <u>E</u> .

Literature Connections/Resources:

- Ellis, Julie. What's Your Angle, Pythagoras? (Angles). Watertown, MA: Charlesbridge Publishing. 2004.
- Murphy, Stuart. Lemonade for Sale. NY: HarperCollins. 1997.
- Neuschwander, Cindy. Sir Cumference and the Great Knight of Angleland (Angles). Watertown, MA: Charlesbridge Publishing. 2002.
- Neuschwander, Cindy. Sir Cumference and the Dragon of Pi (Circles). Watertown, MA: Charlesbridge Publishing. 1999.

ACCRS: 4.26

Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Mastered:

Students can draw points, lines, line segments, ray, and angles.

Present:

Students will write their names in 3-dimensional letters and label points, line segments, parallel and perpendicular lines, vertices, angles, edges, and faces;
OR make origami figures and label as in 3-dimensional letters.

Going Forward:

Students will construct a modern neighborhood using 3-dimensional shapes made from toothpicks or straws.

Present and Going Forward Vocabulary:

Lines, line segments, parallel lines, perpendicular lines, rays, angles, obtuse angle, acute angle, faces, edges, 2 – dimensional, 3 – dimensional

Career Connections:

Architect, Engineer, Construction Worker, Artist

Advanced Understanding & Activity (Alternate activity): (Student pages are located in Appendix A, and the Project Planner is located in Appendix B.)

What's In a Name?

Student Instructions: Use the Web site below to help you prepare to write your name in 3-dimensional letters.

<http://www.my-how-to-draw.com/how-to-draw-3d-letters.html>

1. On a piece of drawing paper, write your name in large 3-dimensional letters.
2. Label one of each of the following, if possible, on each letter:
 - A. Line segment
 - B. Perpendicular lines
 - C. Parallel lines
 - D. Vertex
 - E. Angles (Find at least one example of each of the following and label:
 - Obtuse angle
 - Acute angle
 - Right angle
 - F. Face
 - G. Edge
- Decorate your letters with geometric designs or tessellations. (Make sure that labels stand out clearly through your decoration!)

Materials Needed:

- Drawing paper
- Pencil
- Ruler
- Crayons, colored pencils, or markers

OR:**Shape Up**

Student Instructions: Read Origami Made Easy by Kunihiko Kasahara or other origami books with geometric shapes

Or go to the following Web site, watch, and follow directions to make one or more of a variety of 3-D origami shapes:

<http://www.youtube.com/watch?v=p3Ntp5lZsF0>

Then follow the directions in #2, A-G above.

Materials Needed:

Origami Made Easy by Kunihiko Kasahara or other origami books with geometric shapes

Going Forward Activity- Math and Literature:

Student Instructions: Read The Village of Round and Square Houses by Ann Grifalconi. Create a modern neighborhood using 3- dimensional shapes made from toothpicks or straws.

Materials Needed

- Straws
- Toothpicks
- Modeling Clay or Silly Putty

Literature Connections/Resources:

- Bowles, Sarah. Drawing Mentor 3, Perspective and 3D Shapes. Amazon Digital Services, Inc. 2012
- DuBosque, Doug. Draw 3D: A Step-by-Step Guide to Perspective Drawing. Grand Rapids, MI: Peel Publishing. 2000.
- Grifalconi, Ann. The Village of Round and Square Houses. NY: Little, Brown Books for Young Readers. 1986.
- Kasahara, Kunihiko. Origami Made Easy. Tokyo: Japan Publications, Inc. 1983.
- How to draw 3-D Letters at:
<http://www.my-how-to-draw.com/how-to-draw-3d-letters.html>
- How to draw in 3-D (animals, faces, and other cool stuff):
<http://www.my-how-to-draw.com/>

ACCRS: 4.27

Classify 2-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Mastered:

Students can classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines.

Present:

Students will classify three-dimensional figures based on the presence or absence of parallel or perpendicular lines.

Going Forward:

Students will deepen their understanding of three-dimensional figures through independent research.

Present and Going Forward Vocabulary:

Parallel lines, perpendicular lines, 2– dimensional, 3– dimensional

Career Connections:

Construction Worker, Architect, Artist, Pilot

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)

Math and Literature: Tomorrow's Alphabet

Student Instructions: Read Tomorrow's Alphabet by George Shannon. Then write a Tomorrow's Alphabet book with geometric terms. Be sure to include 2 and 3-dimensional shapes, different types of lines and angles, and any other language, important related people, and tools of the discipline in your book.

Literature Connections/Resources:

- Shannon, George. Tomorrow's Alphabet. NY: Mulberry Books. 1999.
- How to draw in 3-D (animals, faces, and other cool stuff):
<http://www.my-how-to-draw.com/>

ACCRS: 4.28

Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Mastered:

Students can recognize a line of symmetry for a 2 – dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts.

Present:

Students will identify more than one line of symmetry in different figures in both 2 – dimensional and 3 – dimensional shapes.

Going Forward:

Students will deepen their understanding of symmetry in 2 and 3-dimensional shapes through independent research.

Present and Going Forward Vocabulary:

Line of symmetry, diagonal, horizontal, vertical, symmetrical, asymmetrical, 2 – dimensional, 3 – dimensional

Career Connections:

Artist, Architect, Civil Engineer, Football Player

Advanced Understanding & Activity (Alternate activity): (Student page is located in Appendix A.)**Symmetrical or Not?**

Student Instructions: Read Captain Invincible and the Space Shapes by Stuart Murphy. Create 2 – dimensional and 3 – dimensional shapes using toothpicks. Use strings to identify lines of symmetry. Using the student page, categorize your shapes as having horizontal, vertical, diagonal, all, or no lines of symmetry.

Materials Needed:

- Toothpicks
- Clay or silly putty
- String
- Scissors
- Student Page

Literature Connections/Resources:

Murphy, Stuart. Captain Invincible and the Space Shapes. NY: HarperColins. 2001.