

**ACCRS: 5.1**

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

**Mastered:**

Students can use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

**Present:**

Students will use the Think Fast activity to demonstrate how symbols are used.

**Going Forward:**

Students will devise their own ways to recognize the order in which the symbols are used to solve problems.

**Present and Going Forward Vocabulary:**

Brackets, parentheses, braces

**Career Connections:**

Math Teacher, Construction Worker, Engineer, Landscape Artist

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

**THINK FAST**

**Student Instructions:** Follow the directions at each letter. Write your answers as quickly as possible on a separate piece of paper. Answers must begin with the letter in the first column. For example, the answers for the first activity must start with the letter “S”. How many can you complete?

OR

S	Three reasons we use symbols or signs in mathematics.
Y	Solve for Y in this equation. $[Y(26+4) + (6 \times 5)] = \{[10(16+4)] - (4 \times 15)/3\}$
M	Why is Math a “universal language”? Are there any other universal languages? What are they? Explain.
B	Think of at least four other areas in life besides mathematics that depend upon the use of symbols to convey meaning. Make a poster categorizing and showing examples of these.
O	Name at least three reasons why symbols are a necessary part of mathematics.
L	What are the kinds of thinking necessary in order to be a good mathematician?

**Tic-Tac-Toe**

**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. Calculate the perimeter of the figure using two different methods. Explain your thinking. Use ( ), { } in at least one of your equations.</p> <div style="text-align: center;"> </div> <p>Which of the two methods do you prefer? Why?</p>	<p>2. What if the order of operations were to be changed from PEMDAS? Create a new order of operations. Explain how your new order of operations works. Make up an equation and solve using your new order of operations. Then solve it again using the standard order of operations (PEMDAS). How did the two solutions compare? Why do we have a set order of operations?</p>	<p>3. Make a list of at least five math symbols besides +, -, x, ÷, =, ( ), [ ], and { }. Research their meanings and pick at least one which is new to you. Use this symbol in one or more original equations. Solve your equation/s. Use the following Web site to help with your research:  <a href="http://www.math-problem-solving.com/math_symbols_glossary.html">http://www.math-problem-solving.com/math_symbols_glossary.html</a></p>
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<p>4. Use mathematical symbols to express the following nursery rhyme two different ways. Include ( ), { }, and [ ] in your equations, as needed.</p> <p>Baa, baa, black sheep Have you any wool? Yes sir, yes sir Three bags full. One for my master, One for my dame, One for the little boy who lives in the lane.</p> <p>Make up a mathematical expression the Nursery Rhyme, Little Miss Muffett.</p>	<p>5. FREE CHOICE</p>	<p>6. Find at least three careers that require the use of mathematical equations. Choose one that grabs your interest and research it. Prepare a visual display of this career to share.</p>
<p>7. Prepare a list of five questions to ask about the history of Algebra. Then go the Khan Academy Web site below. After viewing, answer as many of your questions as possible.</p> <p><a href="http://www.khanacademy.org/math/algebra/introduction-to-algebra/overview_hist_alg/v/origins-of-algebra#">http://www.khanacademy.org/math/algebra/introduction-to-algebra/overview_hist_alg/v/origins-of-algebra#</a></p>	<p>8. The Supreme Court has outlawed the use of symbols. What might be the many, different effects?</p> <p>Write a story about a day in your life.</p>	<p>9. Send an e-mail to a friend (real or imaginary) who hates Math or who suffers from Math anxiety. Tell them why Math is an important part of everyday living. Give them at least two pieces of advice to help them overcome their Math anxiety.</p>

**Literature Connections/Resources:**

- Pittman, Helena Clare. A Grain of Rice. NY: Yearling Publishing. 1995.
- Tahan, Malba. The Man Who Counted: A Collection of Mathematical Adventures. NY: W. W. Norton & Company. 1994.
- Wright, Blanche. The Real Mother Goose. NY: Scholastic Books. 1994.
- [www.solving-math-problems.com/math-symbols](http://www.solving-math-problems.com/math-symbols)

**ACCRS: 5.2**  
Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.  
*Examples:* Express the calculation “add 8 and 7, then multiply by 2” as  $2 \times (8 + 7)$ . Recognize that  $3 \times (18,932 + 921)$  is three times as large as  $18,932 + 921$ , without having to calculate the indicated sum or product.

**Mastered:**  
Students can write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.

**Present:**  
Students will demonstrate that they are able to interpret numerical expressions without evaluating them.

**Going Forward:**  
Students will go on the cited Web site to play the games and complete Levels 2 and 3 accordingly. **Web site:** [www.mathplayground.com](http://www.mathplayground.com) (click on Math Games, type in Algebraic Reasoning in the Search Box)

**Present and Going Forward Vocabulary:**  
Simple expressions, quotient, product

**Career Connections:**

Technicians, Math Professors, Astronauts, Architect

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

**Optional:** Teacher may want to print out additional activity pages from the Web page in both activities.)

**Algebraic Expressions Game**

*Student Instructions:*

1. Go to this Web site: [http://mathplayground.com/algebraic\\_reasoning.html](http://mathplayground.com/algebraic_reasoning.html)
2. Choose Math Games 1
3. Select the Game, “Algebraic Reasoning 1, Weigh the Wangdoodles.” OR “Algebraic Reasoning 2, Algebraic Puzzle.”
4. After playing the game, answer this question on your own paper: Why is Algebraic Reasoning an important skill?

**OR**

**WebQuest**

*Student Instructions:* Complete a WebQuest at the link below to build a new community center for Cheektowaga.

1. Go to <http://www.teacherwebquest.com/NY/CheektowagaCentral/mrsquinn/h1.aspx>
2. After reading the introduction, click through each tab in the menu bar through “Evaluation.”
3. Share your work with your teacher.

**Literature Connections/Resources:**

- Isdell, Wendy. A Gebra Named Al. NY: Free Spirit Publishing. 1993.
- Kroll, Virginia. Equal Shmequal. Boston: Charlesbridge Inc. 2005.
- Math Game: Algebraic Reasoning  
[http://mathplayground.com/algebraic\\_reasoning.html](http://mathplayground.com/algebraic_reasoning.html)
- Web Quest: Building Cheektowaga Central Community Center  
<http://www.teacherwebquest.com/NY/CheektowagaCentral/mrsquinn/h1.aspx>

**ACCRS: 5.3**

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.

*Example:* Given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

**Mastered:**

Students can generate two numerical patterns using two given rules.

**Present:**

Students will generate numerical patterns using given rules by completing the listed activity.

**Going Forward:**

Students will identify apparent relationships between corresponding terms.

**Present and Going Forward Vocabulary:**

Numerical patterns, coordinate plane

**Career Connections:**

Hydrologist, Psychometrician, Urban Planner, Air Traffic Controller

The Alternative Key	List three other ways to write a decimal without using a decimal point. Show examples and explain how these numbers are equivalent.
Interpretations	Write a story to explain what would happen if decimal points rebelled and took a holiday. (Read the book, Punctuation Takes a Vacation before writing your story.)
Alphabet	Create an alphabet book of Decimals, writing and illustrating the different terms.
Disadvantages	List the disadvantages of solving math problems without decimals.

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

**Picture This**

*Student Instructions:*

1. Read the book, A Fly on the Ceiling by Julie Glass.
2. Draw a simple picture that can be formed with straight lines connecting points on a coordinate grid. Use at least 6 points but no more than 16 points.
3. Record the ordered pairs you plotted in the order in which you connected them.
4. Next, triple each number of the original pair and plot the ordered number pairs on a second grid. Connect the points in the same order that you plot them.

**Challenge:**

What would happen if you:

- a. Tripled each number of the original pair?
- b. Tripled only the first number of each original ordered pair?
- c. Tripled only the second number of each original ordered pair?

*Materials:*

Copy of the story, A Fly on the Ceiling by Julie Glass.  
Coordinate grid paper found in Appendix A.

**Literature Connections/Resources:**

- Glass, Julie. A Fly on the Ceiling. NY: Random House. 1998.
- Nagda, Ann W., Bicket, Cindy. Chimp Math: Learning About Time from a Baby Chimpanzee. NY: Henry Holt and Company. 2002.
- Web site: <http://illuminations.nctm.org> (click on grade level, put in the standard and search).

**ACCRS: 5.4**

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.

**Mastered:**

Students can 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.

**Present:**

Students will answer questions/ create books about decimal points or the lack of them.

**Going Forward:**

Students will recognize that in a multi-digit number a digit in place represents 100 times as much as it represents in the place two to the right and 1/100 of what it represents in the place two to its left.

**Present and Going Forward Vocabulary:**

Tenths, hundredths, thousandths, millionths

**Career Connections:**

Carpenter, Accountant, Nurse/Doctor, Engineer

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

**THINKER KEYS:**

*Student Instructions:* Answer at least three of these questions. You may need to research before answering.



Students will read, write and compare decimals to the thousandths.

Students will arrange a group of decimals in order from least to greatest or greatest to least and write in fraction form.

Students will read, write, and compare decimals to the millionths place.

**Present and Going Forward Vocabulary:**

Decimal point, compare, least, greatest, thousandths, millionths

**Career Connections:**

Scientist, Inventor, Architect, Physicist, Mathematician, Economist, Machinist, Metal worker

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)  
**Math and Children’s Literature**

*Student Instructions:* Read or listen to the book Fractions, Decimals, and Percents by David Adler. Then create a PowerPoint, Comic Strip, or poster putting the examples from the book in order from least to greatest.

**OR**

**Decimal Order Game**

*Student Instructions:* Play the game as explained in **Advanced Understanding & Activity (Alternate activity) for objective 5.7.**

**Literature Connections/Resources:**

- Adler, David. Fractions, Decimals, and Percents. NY: Holiday House. 2011.
- Adler, David. Fraction Fun. NY: Holiday House. 1997.
- Shaskan, Trishia. If You Were a Fraction (Math Fun). Mankato MN: Picture Window Books. 2008.

**ACCRS: 5.7**

Use place value understanding to round decimals to any place.

**Mastered:**

Students will use place value understanding to round decimals to any place.

**Present:**

Students will put rounded decimals in order from least to greatest.

**Going Forward:**

Students will write decimals in fraction form.

**Present and Going Forward Vocabulary:**

Decimal, rounded, least, greatest, hundredths, thousandths

**Career Connections:**

Microbiologist, Optometrist, Purchasing Manager

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

**Decimal Order Game**

Students will create decimal numbers and put them in order from least to greatest. Then they will roll a die four times and create a decimal number to thousandths. Finally, they will arrange their decimals from least to greatest.

*Student Instructions:*

1. Roll a die four times.
2. Write each number on an index card to make a 4-digit decimal.

*See Example:* You roll 3, 6, 7, and 1. Write these 4 digits on the same index card to create a decimal to the thousandths.

3. Round your decimal to the nearest hundredth.

Decimal		Rounded to Nearest Hundredth
.3671	=	.367

- Repeat, using a separate card to record numerals until each player has 6 different decimal cards.
- Arrange your own cards in order from least to greatest.
- The player who finishes first and arranges the numbers correctly gets one point.
- The first player to get 10 points wins the game.

**Extension: Scrambled Decimals Game**

After rolling the dice 4 times and recording each numeral, arrange the numerals in four different ways. Round each to the nearest hundredth. Compare with a partner. Whichever partner has the largest number wins a point. The first person to reach 10 points wins.

*Example:*

Decimal	.3671	.1673	.7361	.7631
Rounded to Nearest Hundredth	.367	.167	.736	.763

Hint: How many ways can you rearrange the numerals in this number to make a different decimal?

**Materials and Supplies:**

Pencils or markers  
Index cards  
1 die for each player

\*Adapted from:

[http://www.lessonpathways.com/Pathways/Detail?path=%2f05\\_Math%2fYear\\_4\\_Math\\_Guided\\_Journey%2f26Rounding\\_and\\_Comparing\\_Decimals%2fDecimal\\_Dice](http://www.lessonpathways.com/Pathways/Detail?path=%2f05_Math%2fYear_4_Math_Guided_Journey%2f26Rounding_and_Comparing_Decimals%2fDecimal_Dice)

**Literature Connections/Resources:**

- Adler, David. *Fractions, Decimals, and Percents*. NY: Holiday House. 2011.
- Converting Fractions to Decimals- Khan Academy  
[http://www.khanacademy.org/math/arithmetic/fractions/decimals\\_fractions/v/converting-fractions-to-decimals](http://www.khanacademy.org/math/arithmetic/fractions/decimals_fractions/v/converting-fractions-to-decimals)

**ACCRS: 5.8**

Fluently multiply multi-digit whole numbers using the standard algorithm.

**Mastered:**

Students can multiply multi-digit whole numbers using the standard algorithm.

**Present:**

Students will multiply multi-digit whole numbers using multiple strategies.

**Going Forward:**

Students will use multiplication strategies to explore division.

**Present and Going Forward Vocabulary:**

Algorithm, digit, simile

**Career Connections:**

Sales Person, Farmer, Jeweler, Accountant, Economist, Business Person, Cartographer, Builder, Carpenter, Designer, Architect

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

**Think Fast**

*Student Instructions:* Follow the directions at each letter. Write your answers as quickly as possible on a separate piece of paper. Answers must start with the corresponding letter. For example, the answers for the first activity must start with the letter “M”. How many of these can you complete?

M	Name four jobs that use multiplication.
U	Find four uses for multiplication in your everyday life.
L	Explain three ways to multiply 24 X 16.
T	How does rounding help in the process of doing mental math multiplication?
I	Research a famous person and tell how they use multiplication in their job.
P	Write two word problems using multiplications as a way to solve the problem.
L	Answer the question: What if multiplication did not exist?
Y	Write a simile about multiplication by filling in the blanks in the sentence starter provided. First, look at the example closely. Then use the sentence stem provided to write your own. <p style="text-align: center;"><i>Example:</i> A smile is as <u>cheerful</u> as the <u>sun</u>                      (adjective) (noun)  <u>breaking through thick, grey clouds on a gloomy day.</u>                      (how, when, or where phrase)</p> <p>Multiplication is as _____ as _____                      (adjective) (noun)                      _____                      (how, when, or where phrase)</p>

**Literature Connections/Resources:**

- Anno, Mitsumasa. Anno’s Magic Seeds. NY: Puffin Books. 1999.
- Anno, Mitsumasa. Anno’s Mysterious Multiplying Jar. NY: Puffin Books. 1999.
- Dodds, Dayle Ann. The Great Divide: A Mathematical Marathon. Somerville MA: Candlewick. 2005.
- Scieszka, Jon. Math Curse. NY: Viking Juvenile. 1995.

**ACCRS: 5.9**

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.

**Mastered:**

Students will find whole number quotients of whole

**Present:**

Students will find whole number quotients of whole numbers with

**Going Forward:**

Students will find decimal quotients of decimals with up

numbers with up to four-digit dividends and two-digit divisors.

up to four-digit dividends and three-digit divisors.

to four-digit dividends and two-digit divisors.

**Present and Going Forward Vocabulary:**

Dividends, divisor, quotients

**Career Connections:**

Pharmacist, Clothing Designer, Appraiser, Stock Broker, Financial Counselor.

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

**Moon Math Division Game**

*Student Instructions:* Read the scenario and work through the problem.

**SCENARIO:** You have been selected by ISA (International Space Agency) to fly the new BELL LUNAR LANDAR Module on its first flight. Can you land it without crashing?

Go to this Web site: <http://www.kidsnumbers.com/division-moon-math.php>

Answer math questions to refuel your craft.

**Literature Connections/Resources:**

- Scieszka, Jon. Math Curse. NY: Viking Juvenile. 1995.
- Moon Math Game  
<http://www.kidsnumbers.com/division-moon-math.php>

**ACCRS: 5.10**

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.

**Mastered:**

Students can add, subtract, multiply, and divide decimals to hundredths.

**Present:**

Students will add, subtract, multiply, and divide decimals to thousandths

**Going Forward:**

Students will add, subtract, multiply, and divide decimals to millionths

**Present and Going Forward Vocabulary:**

Add, subtract, multiply, divide, decimals, hundredths, thousandths, millionths

**Career Connections:**

Construction, Surveyor, Nuclear Scientist

**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. Complete the contract and give to your teacher.

1. Write an ADDITION word problem about going shopping at the mall and spending \$500.00 of your birthday money.

2. Start out with \$1000.00 and create a budget for planning a graduation party. Don't forget plates, utensils, and entertainment.

3. Read Tomorrow's Alphabet by George Shannon. Then use the Yesterday's Alphabet Book Help Page to write a Yesterday's Alphabet book about decimals. Create a word to go with each letter of the alphabet. Remember to illustrate.

4. Create a board game that includes adding, subtracting, multiplying, and dividing decimals to the thousandths place.	5. STUDENT CHOICE	6. List all of the ways the lunchroom manager or principal uses decimals by adding, subtracting, multiplying and dividing
7. Make a poster explaining to a younger child how to add, subtract, multiply, and divide decimals to the thousandths.	8. Create a questionnaire and conduct a survey to determine how adults how decimals are used in their jobs.	9. Write an addition, subtraction, multiplication, and division problem all having an answer of 75.125

**Literature Connections/Resources:**

- Anno, Mitsumasa. Anno’s Mysterious Multiplying Jar. NY: Puffin Books. 1999.
- Calvert, Pam. The Multiplying Menace Divides. Watertown, MA: Charlesbridge Press. 2011.
- Scieszka, Jon. Math Curse. NY: Viking Juvenile. 1995.
- Shannon, George. Tomorrow’s Alphabet. NY: Greenwillow Books. 1996.
- <http://www.youtube.com/watch?v=0JB3bNfLqEM>

**ACCRS: 5.11**

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.

*Example:  $2/3 + 5/4 = 8/12 + 15/12 = 23/12$ . [In general,  $a/b + c/d = (ad + bc/bd)$ .]*

**ACCRS: 5.12:**

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.

**Mastered:**

Students can add and subtract fractions with like and unlike denominators, including mixed numbers and with word problems.

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

**Present:**

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

OR, they may choose to complete the recipe activity.

**Going Forward:**

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

OR, students may make and share their cookies with the class, explaining how they increased the amount by  $2 \frac{1}{2}$  times.

**Present and Going Forward Vocabulary:**

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

**Career Connections:**

Carpenter, Construction Worker, Cook, Machinist, Seamstress, Engineering, Architect, Chef, Store Manager

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

Students will choose **one** of the activities to complete. They may choose at least one of the RAFT activities or Be the Chef.

**Fraction RAFT**

RAFT is an acronym for Role, Audience, Format, and Topic. They will take on a particular role, then develop a product for a specified audience in a particular format. The activity must also adhere to the given topic.

When the RAFT is completed, they may plan a presentation to share the work with their peers.

*Student Instructions:* Choose one row. Research and write about the TOPIC from the perspective of the ROLE to the AUDIENCE using the FORMAT. You may want to plan your product using the organizational tool, Primary Project Planner.

<u>ROLE</u>	<u>AUDIENCE</u>	<u>FORMAT</u>	<u>TOPIC</u>
Unlike Denominators Subtraction Problem	Like Denominators Subtraction Problem	Advice Column	We Can Work It Out!
Like Denominator Addition Problem	Unlike Denominator Addition Problem	Infomercial	It's a Bargain to Be Like!
Recipe	Baker	Recipe Book	Reduce Me to $\frac{1}{4}^{\text{th}}$
Improper Fraction	Mixed Number	Photo Story Movie	My Long Lost Twin!

**OR**

**Be the Chef!**

*Student Instructions:* Read the Scenario and complete the assignment.

**SCENARIO:** As the head chef in a famous restaurant, you feel you can meet any challenge “thrown” at you. You have been told by the restaurant owner that a bigger than usual crowd is expected for the evening meal. In order to feed all of the hungry diners (your classmates!), you will need to increase your dessert recipe by **2  $\frac{1}{2}$  times**. Do the math and illustrate on a poster to share with your boss (Your teacher!). Then make the recipe and feed your hungry diners.

**Bale Bars No Bake**

Ingredients:

- 1  $\frac{1}{2}$  oz. (3 tbsp.) unsalted butter
- $\frac{1}{3}$  cup firmly packed dark brown sugar
- $\frac{1}{3}$  cup heavy cream
- 1 tsp. fleur de sel, divided\*
- 8 oz. good-quality white chocolate, chopped
- 1 tbsp. plus  $\frac{1}{2}$  tsp. pure vanilla extract, divided
- $\frac{3}{4}$  cup crunchy peanut butter
- $\frac{3}{4}$  cup (about 4 oz.) salted peanuts, coarsely chopped
- 3 cups (about 8  $\frac{1}{2}$  oz.) salted thin pretzel sticks, crushed into small pieces

Cooking Instructions:

1. Lightly spray a 9-by-13-inch baking pan with nonstick cooking spray and line it with parchment paper, allowing the parchment to overhang on two sides.
2. In a medium saucepan over low heat, melt the butter.
3. Stir in the sugar, cream, and  $\frac{1}{2}$  tsp. fleur de sel. Increase the heat to medium and bring the mixture to a low boil for about 4 minutes.
4. Remove the pan from the heat and add the white chocolate and 1 tbsp. vanilla.
5. Stir until the mixture is smooth and the chocolate is melted. Add the remaining  $\frac{1}{2}$  tsp. fleur de sel and  $\frac{1}{2}$  tsp. vanilla, and the peanut butter and stir until the mixture is completely smooth and uniform.

6. Place the peanuts and pretzels in a large bowl and use your hands to toss together until mixed well. Pour the white chocolate mixture over the peanut mixture and stir to coat all of the pieces. Pour the mixture into the prepared pan, then, using lightly oiled hands, press the mixture into an even layer. Refrigerate until hard, about 90 minutes.
7. Lift the bars out of the pan using the parchment paper overhang and cut them into squares. Bars can be served at room temperature, but are best directly from the refrigerator (or even the freezer). The bars can be stored in the refrigerator, tightly covered, for up to 3 days.

\*You may need to research this ingredient to learn what it is and where to get it.

**Literature Connections/Resources:**

- Dodds, Dayle. Full House: An Invitation to Fractions. Somerville, MA: Candlewick. 2009.
- Pallotta, Jerry. Hershey Fractions. NY: Scholastic. 1999.

**ACCRS: 5.13**

Interpret a fraction as division of the numerator by the denominator ( $a/b = a \div b$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

*Examples:* Interpret  $\frac{3}{4}$  as the result of dividing 3 by 4, noting that  $\frac{3}{4}$  multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size  $\frac{3}{4}$ . If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between which two whole numbers does your answer lie?

**Mastered:**

Students can interpret a fraction as division of the numerator by the denominator and solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.

**Present:**

Students will apply their knowledge of solving division word problems to write their own real life word problems whose answers result in the form of fraction or mixed numbers.

**Going Forward:**

Students will identify real life situations that involve division and create a book of situations that results in fractional answers.

**Present and Going Forward Vocabulary:** Fraction, numerator, denominator, division, mixed number improper fraction

**Career Connections:**

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

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

The students will make up word problems from everyday life to create their own Math Curse book called Fraction Curse.

**The Fraction Curse**

*Student Instructions:* Read the Scenario and complete the assignment.

**SCENARIO:** Jon Scieszka, the author of Math Curse, is looking for some ideas to write a new book entitled, Fraction Curse. He has asked for your help in writing the book. Read Math Curse, then create a book that has a similar storyline to Math Curse, except all of your situations should involve fractions. At least five of your situations should involve division that results in an answer with a fraction or a mixed number. Be sure to make your book attractive to readers.

Use the student page below to help you to organize your ideas for the new book.

**Dividing Situations**

*Student Instructions:* Think of some situations in real life when you would need to divide.

List your ideas below.

My Ideas
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Now, think of real life situations where the division problem would result in an answer that is a fraction or mixed number. Write at least five division word problems that result in a fraction or mixed number.

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**Literature Connections/Resources:**

- Scieszka, J and Smith, L. Math Curse. NY: Penguin Books. 1995.
- Other Ideas for Using Math Curse: <http://ethemes.missouri.edu/themes/1669>

**ACCRS: 5.14**  
 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

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

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.

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

**Present:**  
 Students will multiply fractions and mixed numbers.

**Going Forward:**  
 Students will multiply mixed numbers.

**Present and Going Forward Vocabulary:**  
 Multiply, fractions, mixed numbers

**Career Connections:**  
 Seamstress, Chef, Inventory Store Manager

**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.

1. Create an Important Book about multiplying fractions. (Preparatory worksheet and template are attached on pages 2-4.)
2. Make a board, card, or dice game using multiplying fractions.
3. Make a chart or poster explaining how to multiply fractions and mixed numbers.

4. Research a job that uses multiplying fractions. Share how their job impacts our lives and if this would be a job you are interested in.
5. Write a list of jobs that use multiplying fractions and tell how multiplying fractions are used in their job.

**Literature Connections/Resources:**

- Marrone, Amanda. *The Multiplying Magic Repair Shop*. NY: Aladdin. 2010
- Wise Brown, Margaret. *The Important Book*. NY: Harper Collins. 1999.

**ACCRS: 5.15**

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  $a/b = nxa/nxb$  to the effect of multiplying  $a/b$  by 1.

**Mastered:**

Students can interpret multiplication as scaling.

**Present:**

Students will construct a model of their classroom to scale.

**Going Forward:**

Students will construct a model of their city/county to scale.

**Present and Going Forward Vocabulary:**

Scaling, model, construct

**Career Connections:**

Architect, Surveyor, Cartographer

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

**Classroom Renovation: Map it Up- Scale It Down**

*Student Instructions:* Read the Scenario and complete the assignment.

**SCENARIO:** Your teacher has decided to renovate your classroom. As the chief interior design committee, it is your team's task to determine the size of each item in the room, fit it to scale in its current configuration, and then to experiment to see how it might fit in another, more attractive and efficient arrangement.

1. Make a scaled, 3-dimensional drawing of the furniture and fixtures in your classroom.
2. Measure each item carefully (For example: desk, filing cabinets, bulletin boards, door, windows, etc.).
3. Use the graph paper provided to reduce the scale to 1 foot = 1/2 inch. Use your scaled drawing to make a 3-dimensional map of your classroom. Then, using the scaled drawings of the desks, bulletin boards, and other moveable items, rearrange in a different order that would be esthetically pleasing.

Use as many graph pages as you need to design your classroom, taping them together, as needed.

Label each item, and write your scale at the bottom of your paper. **Hint:** Consider cutting out the scaled pictures of the items that are moveable. Once you have drawn in the stationary items, such as doors, windows, shelves, etc., arrange and re-arrange the moveable items such as desks, bulletin boards, filing cabinet, etc. until you find the most pleasing design. Then glue in place according to scale.

**Extension:** Present the scaled drawing of your old and newly arranged classroom to your teacher and the class. "Sell" your idea for the renovation in a persuasive speech explaining why your design as a better arrangement than the one that you already have.

**Literature Connections/Resources:**

- Taylor, Barbara. Geography Facts Maps and Mapping (Young Discoverers and Experiments). NY: Kingfisher Publishing. 1995.
- [http://www.youtube.com/watch?v=V96\\_PjlrVQc&list=PL85D18DB378C2CE32](http://www.youtube.com/watch?v=V96_PjlrVQc&list=PL85D18DB378C2CE32)

**ACCRS: 5.16**

Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

**Mastered:**

Students can solve real-world problems involving multiplication of fractions and mixed numbers.

**Present:**

Students will solve multi-step real-world problems involving multiplication of fractions and mixed numbers.

**Going Forward:**

Students will solve real-world problems showing multiple problem solving methods at Levels 3 and 4 Depths of Knowledge (DOK).

**Present and Going Forward Vocabulary:**

Multi-step problems, real-world problems, fractions, mixed numbers, multiplications

**Career Connections:**

Carpenter, Saw Operator, Nature Conservator

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

**Multiplying My Way!**

*Student Instructions:* With Math in mind, think about a day in your life. Then do the following:

- Read one or more of these books to see how fractions are part of everyday life.
  - Math Curse by Jon Scieszka
  - Funny and Fabulous Fraction Stories by Dan Greenberg
  - Polar Bear Math by Ann Nagda and Cindy Bickel
- Jot down some of the Math problems you encounter as you go about your everyday tasks, such as getting dressed, going to school, eating lunch, going to the store, etc. Make sure that some of your problems involve situations where you must multiply fractions with mixed numbers.)
- Solve three of the problems that involve fractions and mixed numbers at least two ways. One of the ways must be by first converting fractions and mixed numbers to decimals, and then solving. (For a demonstration on how to do this, watch one of the videos at the following links:)
  - <http://www.youtube.com/watch?v=Gn2pdkvdbGQ>
  - [http://www.youtube.com/watch?v=do\\_IbHId2Os](http://www.youtube.com/watch?v=do_IbHId2Os)
- Finally, decide which of the ways you is the best way to solve the problems. Use the graphic organizer at the following link to help you write a persuasive letter to your teacher explaining why the way you chose is the best way.
  - <http://education.wm.edu/centers/cfge/documents/curriculum/teachingmodels/primaryhamburger.pdf>

**Literature Connections/Resources:**

- Scieszka, J and Smith, L. Math Curse. NY: Penguin Books. 1995.
- Greenberg, Dan. Funny and Fabulous Fraction Stories. NY: Scholastic Press. 1999.
- Nagda, Ann. Polar Bear Math. NY: Square Fish Publishing. 2007.

**ACCRS: 5.17**

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Students able to multiply fractions in general can develop strategies to divide fractions in general by reasoning about the relationship between multiplication and division. However, division of a fraction by a fraction is not a requirement at this grade.)

- a. Interpret division of a unit fraction by a nonzero whole number, and compute such quotients.  
*Example:* Create a story context for  $(1/3) \div 4$ , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $(1/3) \div 4 = 1/12$  because  $(1/12) \times 4 = 1/3$ .
- b. Interpret division of a whole number by a unit fraction, and compute such quotients.  
*Example:* Create a story context for  $4 \div (1/5)$ , and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that  $4 \div (1/5) = 20$  because  $20 \times (1/5) = 4$ .
- c. Solve real-world problems involving division of unit fractions by nonzero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.  
*Examples:* 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?

**Mastered:**

Students can apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

**Present:**

Students will use division of fractions to divide fractions and mixed numbers.

**Going Forward:**

Students will be able to research how much each meal would cost and create a budget to go with it.

**Present and Going Forward Vocabulary:**

Divide, fractions, mixed numbers

**Career Connections:**

Baker, Dancer, Lineman

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

**M-M-Good! Menu**

*Student Instructions:* Research your favorite meals using a cookbook. Plan a menu for breakfast, lunch, or dinner that serves multiple people. Rewrite the recipe (with fractions and mixed numbers) so that it only serves one person.

**Literature Connections/Resources:**

- Better Homes and Gardens. Better Homes and Gardens New Junior Cook Book (Better Homes and Gardens Cooking). Garrison, ND: Better Homes and Gardens. Aug 14, 2012.
- Crocker, Betty. Betty Crocker Kids Cook! Minneapolis, MN: Betty Crocker Publishing. 2007.

**ACCRS: 5.18**

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multistep, real-world problems.

**Mastered:**

Students can convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multistep, real-world problems.

**Present:**

Students will convert metric units of measurement and solve multi-step problems found in the real world and demonstrate this in a That's Good! That's Bad CHAIN STORY.

**Going Forward:**

Students will write real world problems of their own that deal with measurement conversion.

**Present and Going Forward Vocabulary:**

Conversion, measurement system, centimeter, meter

**Career Connections:**

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

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

**That's Good! That's Bad! CHAIN STORY**

*Student Instructions:*

- Research the following questions.
  2. What would happen if we lived in a society that had no standards of measurement?
  3. How do standards of measurement help with communication?
- Then read the That's Good! That's Bad! Scenario and write and illustrate the chain of events to show the positive and negative situations surrounding the scenario. You may use additional sheets of paper in order to complete your story.

**SCENARIO:** You are the cook in the Kingdom of Naptilia and the king's daughter is getting married. You are in charge of preparing the food for the grand celebration party.

**Oh, that's good! No that's bad!** \_\_\_\_\_

\_\_\_\_\_

**Oh, that's bad! No, that's good!** \_\_\_\_\_

\_\_\_\_\_

**Literature Connections/Resources:**

- Adler, David A. How Tall, How Short, How Far Away? (Length). NY: Holiday House. 2000.
- Crummel, Susan. Cook-A-Doodle-Do! (Capacity). Chicago: HMH Books for Young Readers. 2008.
- Herman, Gail. Keep Your Distance (Length). NY: Kane Press. 2001.
- Myller, Rolf. How Big Is a Foot? NY: Yearling. 1998.
- Sweeney, Joan. Me and the Measure of Things (Length, Weight, Capacity) Decorah, IA: Dragonfly Books. 2002.
- Wells, Robert E. Is a Blue Whale the Biggest Thing There Is? NY: Albert Whitman & Co. 1993.
- Wells, Robert E. What's Smaller Than a Pygmy Shrew? NY: Albert Whitman & Co. 1995.

**ACCRS: 5.19**

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.

*Example:* Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

**Mastered:**

Students can make a line plot to display a data set of measurements in fractions of a unit ( $1/2$ ,  $1/4$ ,  $1/8$ ). Use operations on fractions for this grade to solve problems involving information presented in line plots.

**Present:**

Students will solve problems involving fractional measurements. Students can analyze and evaluate online games that deal with measurement.

**Going Forward:**

Students will create line plots with mixed numbers and decimals.

**Present and Going Forward Vocabulary:**

Line plot, data set, fraction, measurement

**Career Connections:**

Advertising, Marketing, Farmer, Surveyor, Human Resource Specialist, Statistician, Petroleum Engineer, Nuclear Engineer, Medical Researcher, Chemist

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

**You Be the Judge**

*Student Instructions:* Read the Scenario and work through the activities as directed.

**SCENARIO:** You have been hired by the marketing department of a computer software company to critique educational math games. In your new position, you are expected to play the new games and write an analysis of each to share with the marketing department.

Game -1 - Fill and Pour.

[http://nlvm.usu.edu/en/nav/frames\\_asid\\_273\\_g\\_2\\_t\\_4.html?from=category\\_g\\_2\\_t\\_4.html](http://nlvm.usu.edu/en/nav/frames_asid_273_g_2_t_4.html?from=category_g_2_t_4.html)

Game -2 - Water Jars

[http://www.coolmath4kids.com/math\\_puzzles/Logic-waterjars/index.html](http://www.coolmath4kids.com/math_puzzles/Logic-waterjars/index.html)

Game -3 - PBS Kids Pour to Score

<http://pbskids.org/cyberchase/games/hardproblems/>

After “testing” each game by playing it, write an analysis of each. Your analysis will follow this format:

1. Give a brief summary about it. Include these things in your summary:
  - a. Game name
  - b. How to access
  - c. Explanation of what each game is about
  - d. Age range of potential players according to the company
  - e. Math or other educational skills addressed in each game
2. Evaluate the game based on:
  - a. Does the game have educational worth? Does it teach the skills that it claims to teach?
  - b. Is it age appropriate for the audience?
  - c. Did you enjoy playing the game?
  - d. Who else might enjoy playing?
  - e. Would this game, in your opinion, be profitable if marketed?
3. Make a final recommendation based on your argument in #2. Remember to use a paragraph format. Your critique will be approximately 3 paragraphs.
4. In order to help the marketing department understand your analysis at a glance, use the table provided to rate each game and give each a final score. You may need to refer to your critique as you decide how to rate each game in the table.

**How to use this table:** (Teacher: See the decision-making table on Student Page 5.19.)

1. Using only the criteria, “Educational Value,” assign a score from 1-5 to each game. **Number value should follow the Lykert scale explained below the table.**
2. Now use only the criteria, “Age Appropriate” to assign a score from 1-5 to each game.
3. Repeat for “Enjoyment” and “Marketability,” rating each game by a single criterion before moving on to the next.
4. Total the scores for each game and record the score in the “Total Scores” column.

**Literature Connections/Resources:**

- Penner, Lucille. Clean-Sweep Campers. NY: Kane Press. 2000.
- Stamper, Judith. Go, Fractions. NY: Penguin Books. 2003.
- Pallotta, Jerry. The Hershey's Milk Chocolate Bar Fractions Book. NY: Scholastic. 1999.
- Murphy, Stuart. Jump, Kangaroo, Jump! NY: Harper Collins. 1998.
- Calvert, Pam. Multiplying Menace: The Revenge of Rumpelstiltskin. Boston: Charlesbridge Publishing. 2006.
- Murphy, Stuart. Lemonade for Sale. NY: Harper Collins. 1997. Fill and Pour
- Fill and Pour  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_273\\_g\\_2\\_t\\_4.html?from=category\\_g\\_2\\_t\\_4.html](http://nlvm.usu.edu/en/nav/frames_asid_273_g_2_t_4.html?from=category_g_2_t_4.html)  
Water Jars

[http://www.coolmath4kids.com/math\\_puzzles/Logic-waterjars/index.html](http://www.coolmath4kids.com/math_puzzles/Logic-waterjars/index.html)

- PBS Kids Pour to Score  
<http://pbskids.org/cyberchase/games/hardproblems/>

**ACCRS: 5.20**

Recognize volume as an attribute of solid figures, and understand concepts of volume measurement.

- 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.
- 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.

**Mastered:**

Students can recognize volume as an attribute of solid figures, and understand concepts of volume measurement.

**Present:**

Students will recognize volume as an attribute of solid figures and demonstrate their understanding of volume measurement in an I CAN activity.

**Going Forward:**

Students will explore other shapes and participate in the Pi Day WebQuest:  
[http://www.mathgoodies.com/webquests/pi\\_day/](http://www.mathgoodies.com/webquests/pi_day/)

**Present and Going Forward Vocabulary:**

Volume, solid, cubic unit

**Career Connections:**

Construction Manager, Industrial Productions Manager, Aerospace Engineer, Biomedical Engineer, Computer and Information Systems Manager, Funeral Director, Property and Real Estate Manager

**Advanced Understanding & Activity (Alternate activity):** (Student page is 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.

- Create a story about a land that is full of 3-dimensional shapes. Illustrate your understanding of volume in the story.
- Make a video that explains the difference between 2- and 3-dimensional shapes. Be sure to discuss volume in your presentation.
- Research artists who use drawings of 3-dimensional shapes and make a presentation to the class about these artists.
- Design a slide show that compares 2- and 3-dimensional shapes. Discuss the meaning of volume in your presentation.
- Build models of three dimensional shapes using construction paper. Measure one of these and write about its volume.
- Create a comic strip based on volume of a 3-dimensional shape.
- Conduct a survey to see if students know the names of both 2- and 3-dimensional shapes. Graph your results.
- Compare three buildings and the use of 3-dimensional shapes in their architectural design.

**Literature Connections/Resources:**

- Crummel, Susan. Cook-A-Doodle-Do! (Capacity). Chicago: HMH Books for Young Readers. 2008.
- Hoban, Tana. Cubes, Cones, Cylinders, and Spheres. NY: Greenwillow Books. 2000.
- Murphy, Sruart. Captain Invincible and the Space Shapes (3-D Shapes). NY: Harper Collins. 2001.

- Paul, Ann. Eight Hands Round (Shapes). NY: Harper Collins. 1996.
- Sweeney, Joan. Me and the Measure of Things (Length, Weight, Capacity). Decorah, Iowa: Dragonfly Books. 2002.

**ACCRS: 5.21**  
 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

<p><b>Mastered:</b>                  Students can measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.</p>	<p><b>Present:</b>                  Students will count cubic volume for different units of measure.</p>	<p><b>Going Forward:</b>                  Students will explore volume of everyday objects and make guesses as to how much capacity these objects have.</p>
<p><b>Present and Going Forward Vocabulary:</b>                  Volume, cubic feet, cubic units</p>		

**Career Connections:**  
 Industrial Production manager, Package Engineer, Aerospace Engineer, Property and Real Estate Agent, Funeral Director, Farmer, Rancher, Agricultural Manger

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

*Student Instructions:* Read the scenario and work through the problem.

**SCENARIO:** You are the Cheese Factory Inspector. Your job is to make sure each block of cheese is cut into equal pieces to be packaged.

Write a report for the boss telling how many packages can be made from three different slabs of cheese. Decide how many cuts will be needed in each chunk of cheese, and design a slicer for the factory. Draw a front view, side view, and top view of the machine. Tell how it works.

In your report, show how you decided to cut the blocks of cheese and explain your reasoning. Then share your blueprint or design for the new slicing machine, along with the explanation of how it works.

Use your own paper for the beginning sketches, then transfer your favorite to the following page and answer the questions about your newly invented cheese slicing machine.

The New, Improved Cheese Slicing Machine:

Views of invented cheese slicing machine:

Side

Front

Top

The new cheese slicing machine will make \_\_\_\_ cuts in each block of cheese, resulting in \_\_\_\_\_ pieces of cheese.

This is how my new cheese slicing machine works.

---



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I decided to design my machine in this way because \_\_\_\_\_

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**Literature Connections/Resources:**

- Burns, Marilyn. Spaghetti and Meatballs for All: A Mathematical Story (Perimeter). NY: Scholastic. 1997.
- Neuschwander, Cindy. Sir Cumference and the Isle of Immeter (Perimeter and Area). Watertown, MA: Charlesbridge. 2006.
- Neuschwander, Cindy. Mummy Math: An Adventure in Geometry (3-D Shapes). NY: Square Fish. 2009.
- Pollack, Pam. Chickens on the Move (Perimeter). NY: Kane Press. 2002.

**ACCRS: 5.22**

- Relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume.
- 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.
  - 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.
  - Recognize volume as additive. Find volumes of solid figures composed of two nonoverlapping right rectangular prisms by adding the volumes of the nonoverlapping parts, applying this technique to solve real-world problems.

**Mastered:**

Students can relate volume to the operations of multiplication and addition, and solve real-world and mathematical problems involving volume.

**Present:**

Students will find the volume of a right rectangular prism and understand the difference in shapes that may have the same volume.

**Going Forward:**

Students will make a list of objects in the classroom that could be measured using the formula for volumes of right rectangular prisms.

**Present and Going Forward Vocabulary:**

Volume, length, width, height, area, base, product, right rectangular prism, associative property

**Career Connections:**

Packaging Engineer, Chemical Engineer, Shipping Company Agent, Ichthyologist, Marine Biologist, Truck Driver, Mover, Transportation Security Agency Agent, Cabinet Maker, Kitchen and Bathroom Designer, Construction Worker

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

**Excite Shampoo**

*Student Instructions:* Read the scenario and work through the problem.

**SCENARIO:** You work for EXCITE shampoo company. Design 3 different 20 ounce bottles and make them appealing to your customers. Design 3 boxes for these three different 20 oz. bottles in which to ship the

product. Be sure to specify the dimensions of the boxes. Do a survey to see which bottle your customers would prefer.

**Literature Connections/Resources:**

Clement, Rod. Counting on Frank. NY: Gareth Stevens Publishing. 1999.

**ACCRS: 5.23**

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).

**Mastered:**

Students can use a pair of perpendicular number lines to define a coordinate system with intersection of the lines arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers.

**Present:**

Students will use coordinate planes to create real world pictures.

**Going Forward:**

Students will map the ocean bottom using 3-D map coordinates.

**Present and Going Forward Vocabulary:**

Coordinate plane, perpendicular, plane, quadrant, plot, ordered pairs, horizontal, vertical, axis, intersection

**Career Connections:**

Engineer, Metal Worker, Surveyor, Construction Worker

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

**Crazy Coordinates:**

*Student Instructions:* Use the coordinates given to draw a picture. Plot all points on line intersections nearest the coordinate number. Then connect the points in order from A-G to make the figure.

OR

**Give Me a Hint!**

*Student Instructions:* Draw a picture on blank four-quadrant graph provided. List the ordered pairs you used to make the lines in the picture. Name each point with a letter, chronologically to make the picture.

*Example:* (-1, 2) A, (-5,0) B, (3, -3) C, (1, -4) D, etc. Plot all points on line intersections for whole numbers. Then connect the points in chronological order to form the figure.

Write a clever hint on the line above the graph to serve as your answer sheet.

Share with a Friend: Give a blank copy of the graphing grid with the ordered pairs and the hint written on it. See if your friend can solve the graphing “puzzle.”

**Challenge:** To make the task more challenging, use whole and half numbers to form curvy lines. Plot points on line segments between numerals for halves or even fourths.

**Literature Connections/Resources:**

- Neuschwander, Cindy. Sir Cumference and the Viking's Map. Watertown, MA: Charlesbridge Math Adventures. 2012.
- Wall, Julia. Mapping Shipwrecks with Coordinate Planes (Real World Math - Level 5). North Mankato, MN. Capstone Press. 2011.

- Mathers, Marci. Coordinate Graphing: Creating Geometry Quilts. Westminster, CA: Teacher Created Resources Co. 2010.
- Housel, Edward & Housel, Debra. Coordinate Graphing: Creating Pictures Using Math Skills, Grades 5-8. Westminster, CA: Teacher Created Resources Co. 2009.
- Geoboard Coordinate Mapping  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_166\\_g\\_2\\_t\\_3.html?open=activities&from=topic\\_t\\_3.html](http://nlvm.usu.edu/en/nav/frames_asid_166_g_2_t_3.html?open=activities&from=topic_t_3.html)
- Geoboard Coordinate Mapping (Advanced)  
[http://nlvm.usu.edu/en/nav/frames\\_asid\\_303\\_g\\_3\\_t\\_3.html?open=activities&from=topic\\_t\\_3.html](http://nlvm.usu.edu/en/nav/frames_asid_303_g_3_t_3.html?open=activities&from=topic_t_3.html)  
<http://www.math->
- Four Quadrant Mapping Web sites:  
[http://www.mathaids.com/cgi/pdf\\_viewer\\_4.cgi?script\\_name=graphing\\_four\\_ordered\\_puzzle.pl&skill=1&language=0&memo=Graphing+Sheet+1&answer=1&x=86&y=21](http://www.mathaids.com/cgi/pdf_viewer_4.cgi?script_name=graphing_four_ordered_puzzle.pl&skill=1&language=0&memo=Graphing+Sheet+1&answer=1&x=86&y=21)  
[http://www.math-aids.com/Graphing/Four\\_Quadrant\\_Ordered\\_Pairs.html](http://www.math-aids.com/Graphing/Four_Quadrant_Ordered_Pairs.html)

<b>ACCRS: 5.24</b> 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.		
<b>Mastered:</b> Students can 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.	<b>Present:</b> Students will represent and justify real-world and mathematical problems by graphing and explain ups and downs of points in the first quadrant of the coordinate values by investing hypothetically in the stock market.	<b>Going Forward:</b> Students will calculate their profit or loss in the stock market after a month of keeping record of the stocks in which they invested.

**Present and Going Forward Vocabulary:**  
Graphing points, quadrant, coordinate plane, stock, invest, commodity, product, service, consumer, producer, profit, trend, product demand, chronological

**Career Connections:**  
Stock Broker, Industrial Engineer, Computer Industry

**Advanced Understanding & Activity (Alternate activity):** (Student pages are located in Appendix A.)  
**Bull or Bear?**  
Students will invest hypothetically in the stock market and keep track of their investment over the period of one month. At the end of one month, they will determine trends in the worth of their stock, calculate their profit or loss, and decide whether or not to sell their stock.

*Student Instructions:* Read the Scenario and complete the assignment.

**SCENARIO:** You have inherited \$10,000 to invest in the Stock Market.

Your Assignment:

1. Watch the videos at these links and visit the Web site below to prepare you to become an investor.
  - You Tube Video: [How the Stock Market Works](#)
  - You Tube Video: [BizKids 4.04 What's Up With The Stock Market?](#)  
Use this link to learn how to read a stock table (a report of the worth of various stocks and how they are doing from day to day).
  - <http://www.dummies.com/how-to/content/how-to-read-a-stock-table.seriesId-103808.html>
2. Choose one or more stocks in which to invest. But first, research the history and the historic performance of several companies in which you are interested. As you make the decision, think carefully about the following criteria:

- How has your chosen company performed historically?
- How long has your company been in business?
- What do they produce or sell?
- Is this a commodity/service that is currently in demand?
- What are some qualities that might indicate that this product/service will continue to be in demand and increase in value in the future?
- Is this a product/service in which you are personally interested?

Using the Decision Making Worksheet and the Decision Making Grid provided, make a decision about which stock/s you will buy.

3. Keep a record of the daily performance of your stock over the next two weeks. Do this by checking the stock market report in a newspaper or on the Internet each day.
4. Graph the gains and losses each day on the graph paper provided.

**Extension:** Keep track of your investment over the next two weeks by graphing the gains and losses per share of each on the Four Quadrant Graph provided on Page 6. You may need to graph each stock in a different color if you plan to keep track of all of your investments on the same graph. (Make a key to indicate companies by color.)

At the end of the two weeks, calculate how much money you gained or lost from your original investment. Decide if this is a product in which you would still be willing to invest and explain why.

**Materials Needed:**

- Computer with Internet access to access daily reports at:  
<http://www.investingdaily.com/free-reports/>
- Daily newspaper with stock market report.
- Graph paper (Student Pages 4 & 6).

**Literature Connections/Resources:**

- Orr, Tamra. [A Kid's Guide to Stock Market Investing \(Robbie Readers\) \(Money Matters: A Kid's Guide to Money\)](#). Mitchell Lane Publishing. 2008.
- You Tube Video: [How the Stock Market Works](#)
- You Tube Video: [BizKids 4.04 What's Up With The Stock Market?](#)
- How the Stock Market Works  
<http://education.howthemarketworks.com/how-to-trade/how-to-trade-stocks/>
- How to Read a Stock Table  
<http://www.dummies.com/how-to/content/how-to-read-a-stock-table.seriesId-103808.html>

**ACCRS: 5.25**

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

*Example:* All rectangles have four right angles, and squares are rectangles, so all squares have four right angles.

**Mastered:**

Students can recognize that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

**Present:**

Students will illustrate attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

**Going Forward:**

Students will be able to justify attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

**Present and Going Forward Vocabulary:**

Attributes, two-dimensional figures

**Career Connections:**

Architect, Interior Designer, Landscape Architect

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

### Jazzy Geometry

*Student Instructions:* Read The Boy with Squared Eyes by Juliet Snape or A Cloak for the Dreamer by Aileen Friedman. Then they group each subgroup of two-dimensional figures into a main category.

*Example:* All squares would be categorized into the main group of quadrilaterals.

Illustrate each figure and explain why they belong in each group. Using the two-dimensional figures, choose one main category and draw a picture using only figures from that category. For example, draw a picture using only quadrilaterals.

### Literature Connections/Resources:

- Friedman, Aileen. A Cloak for the Dreamer. NY: Scholastic Press. 1994.
- Snape, Juliet. The Boy with Squared Eyes. NY: Prentice Hall. 1987.

### ACCRS: 5.26

Classify two-dimensional figures in a hierarchy based on properties.

#### Mastered:

Students can classify two-dimensional figures.

#### Present:

Students will elaborate on two-dimensional figures in their environment.

#### Going Forward:

Students will be able to classify three-dimensional shapes based on the hierarchy of two-dimensional shapes.

### Present and Going Forward Vocabulary:

Two-dimensional, figures, three-dimensional

### Career Connections:

Brick Layer, Cartographer, Architect, Artist, Builder, Interior Designer, Dancer

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

### I Can...

*Student Instructions:* Students will choose at least one of the activities to complete.

1. Create a poetry book of shapes. Take photographs or draw shapes seen in the school, home, or community environment. Next to each shape picture, write a poem that includes the attributes of each shape.
2. Create your dream house/room. Be sure to include at least six different shapes that are labeled. Extension: Use toothpicks and marshmallows to make a three-dimensional version.
3. Create a tessellation using a 2-dimensional shape. Use these Web sites to help you.  
Tessellation Art- Explore history, how to make, tessellation themes, and more.  
<http://www.tessellations.org/software-tesselmaniac.shtml#>  
How to make a tessellation (Paper Cut Method)  
<http://www.tessellations.org/methods-diy-papercut.shtml>
4. Make an alphabet book by photographing 2-dimensional and 3-dimensional shapes found in the school, home, and/or community environment. (Read Alphabet City or City by Numbers by Stephen Johnson to see examples of how this was done with letters and numbers.)
5. Make a collection of "Guess What?" pictures. Photograph a shape that is part of a larger item or structure from your surroundings. Take the photograph close up so that none of the larger part of the item or structure shows in the picture except for the targeted geometric shape. Give the collection to a friend and ask them to identify both the shape and the larger structure to which it belongs.

**Extension:** Use the Venn diagram provided to classify each shape according to the hierarchy of geometric shapes.

### Literature Connections/Resources:

- The Metropolitan Museum of Art. Museum Shapes  
<http://www.bing.com/images/search?q=Metropolitan+Museum+of+Art+and+shapes&qpv=Metropolitan+Museum+of+Art+and+shapes&FORM=IGRE>
- Banyai, Istvan. Zoom. NY: Puffin. 1998.

- Banyai, Istvan. Rezoom. NY: Puffin. 1998.
- Johnson, Stephen. Alphabet City. NY: Puffin. 1999.
- Johnson, Stephen. City by Numbers. NY: Puffin. 2003.
- Weisner, David. Free Fall. NY: Harper Collins. 1991.
- Tessellation Art- Explore history, how to make, tessellation themes, and more.  
<http://www.tessellations.org/software-tesselmaniac.shtml#>
- How to make a tessellation (Paper Cut Method)  
<http://www.tessellations.org/methods-diy-papercut.shtml>