



404238-EB

MATH

GR

6

For College and Career Readiness



Preparation and Practice



- Prerequisite Math Skills
- Job-Specific Concepts
- Age-Appropriate Jobs
- Careers for the Masses
- STEM Careers



About the Authors

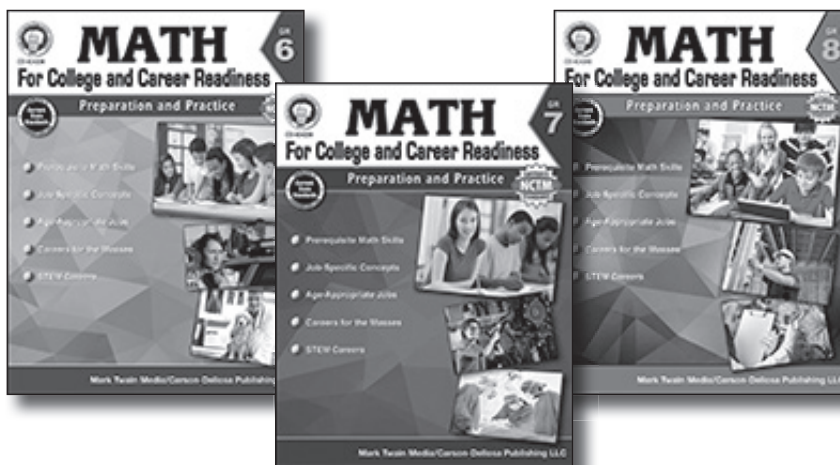
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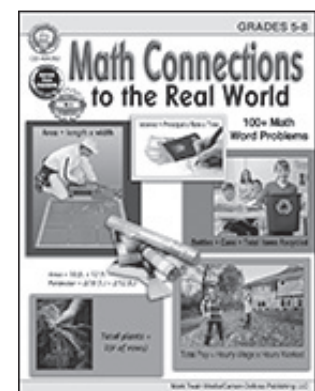
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Math for College and Career Readiness

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to the Real World**

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Math for College and Career Readiness Grade 6

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Introduction to the Teacher

Up to half of students entering college elect “undecided” for their major, and an estimated three out of four students change their majors at least once before graduation. This is, in part, due to the fact that middle- and high-school students do not have much exposure to the variety of careers available to today’s work force. This workbook is designed to give middle-school students an idea of existing careers and the background and skills necessary to be successful in those careers.



The first three units focus on jobs students could do right now to start building their resumes and earning some money. The next three units focus on careers that require at least some post-secondary schooling. The final three units emphasize STEM-related careers, where science, technology, engineering, and mathematics play a significant part.

Each unit is aligned to the Common Core State Standards for Mathematics. This correlation is included on the teacher page at the beginning of each unit. The units also support the NCTM standards. The teacher page includes background on the career, the average median salary listed by the 2015 U.S. Bureau of Labor Statistics, a detailed explanation of the topics covered in the unit, and a list of prerequisite skills necessary to complete the unit.

We hope your students enjoy exploring these different careers and that this exploration helps prepare them for college and their future careers.



—Stephen Fowler, Christine Henderson, Amy Jones-Lewis, and Karise Mace



Unit 1: The Mathematics of Lemonade Stands

Introduction

Operating a lemonade stand is a great way to spend time with friends on a nice day while learning about what it takes to run a business. Almost anyone can run a lemonade stand, but running a successful one requires mathematics, such as understanding ratios and proportions, calculating values with rational numbers, solving basic equations, and working with money.



Whether using a powdered mix or making all-natural lemonade from fresh ingredients, ratios and proportions are the fundamental tools used to mix large quantities of lemonade from a basic recipe designed to make only a small amount. Having enough lemonade to sell to a lot of customers is essential to running a successful lemonade stand. Understanding how to adjust the size of a recipe using ratios and proportions is extremely important.

Deciding how many cups of lemonade to pour, figuring out how much to sell to break even, and splitting profits among everyone running the lemonade stand require working with rational numbers and solving equations. These are necessary skills to keep a lemonade stand going.

Whether to raise money for charity or save up to buy a nice gift, the purpose of a lemonade stand is to make money. Every time a cup of lemonade is sold or ingredients to make more lemonade are purchased, calculations involving money are made. As a result, having strong money-related math skills is essential to running a successful lemonade stand.

These are just some of the ways mathematics is used to run a business and will be the focus of this unit as students explore the math needed to operate a lemonade stand.

Common Core State Standards

This unit addresses the following Common Core State Standards:

- CCSS.Math.Content.6.RP.A.2
- CCSS.Math.Content.6.RP.A.3
- CCSS.Math.Content.6.NS.A.1
- CCSS.Math.Content.6.NS.B.3
- CCSS.Math.Content.6.EE.B.6
- CCSS.Math.Content.6.EE.B.7

Prerequisite Skills

Prior to completing this unit, students should be proficient in the following mathematical skills: (Note: A practice sheet has been provided for each skill listed.)

- Solving problems involving ratios and proportions
- Adding, subtracting, multiplying, and dividing rational numbers
- Working with money

Name: _____ Date: _____

Unit 1: The Mathematics of Lemonade Stands

Prerequisite Skill Practice—Ratios and Proportions

Directions: Complete each exercise as indicated. Show your work. The first problem has been worked out as an example.

1. The ratio of girls to boys in a class is 3:1. How many boys are in the class if there are 21 girls in the class? $\frac{3}{1} = \frac{21}{x}$ $x \cdot 3 = 1 \cdot 21$ $3x = 21$ $x = 21 \div 3$ $x = 7 \quad \text{There are 7 boys in the class.}$	2. A recipe calls for $2\frac{1}{4}$ cups of flour and $1\frac{1}{2}$ cups of sugar. How many cups of sugar are needed for 9 cups of flour?
3. Determine the value of n (write your answer as a decimal): $\frac{n}{32} = \frac{9}{20}$	4. Determine the value of x (write your answer as a mixed number): $\frac{8}{15} = \frac{x}{40}$
5. The ratio of cars to trucks on a particular road is 10:3. How many cars are on the road if there are 42 trucks on the road?	6. Determine the value of a (write your answer as an improper fraction): $\frac{6}{a} = \frac{21}{34}$
7. Determine the value of c: $\frac{11}{19} = \frac{7}{c}$	8. A word contains 5 consonants for every 3 vowels. How many letters are in the word if it contains 9 vowels?

Name: _____ Date: _____

Unit 1: The Mathematics of Lemonade Stands

Prerequisite Skill Practice—Operations With Rational Numbers

Directions: Calculate each value as indicated. Show your work. Write your answer as a simplified fraction or mixed number. The first problem has been worked out as an example.

1. $17\frac{3}{10} - 8\frac{1}{6}$ $17\frac{3}{10} - 8\frac{1}{6} = 17\frac{9}{30} - 8\frac{5}{30}$ $= 9\frac{4}{30}$ $= 9\frac{2}{15}$	2. $7\frac{1}{5} \div 6\frac{3}{4}$
3. $12\frac{3}{4} \cdot 8\frac{1}{2}$	4. $9\frac{3}{8} + 2\frac{5}{6}$
5. $12\frac{1}{2} \div 4\frac{1}{6}$	6. $\frac{4}{7} \cdot 2\frac{1}{10}$
7. $10\frac{7}{12} + 1\frac{2}{3}$	8. $7\frac{3}{4} - 2\frac{5}{6}$
9. $\frac{7}{8} - \frac{7}{9}$	10. $4\frac{3}{8} \div \frac{2}{5}$

Name: _____ Date: _____

Unit 1: The Mathematics of Lemonade Stands

Prerequisite Skill Practice—Working With Money

Directions: Complete each exercise as directed. Show your work. Be sure to label your final answers. The first problem has been worked out as an example.

1. What is the total cost of 8 pounds of bananas if bananas cost 49¢ per pound? $8 \cdot 0.49 = 3.92$ The total cost is \$3.92.	2. Determine the cost of one baseball if a case containing one dozen baseballs costs \$45.00.
3. Grace and Henri want to use binders to organize their files. Grace purchases 15 binders to organize her files for a total of \$44.25. Henri purchases 25 binders to organize his files. How much did Henri spend on his binders?	4. Brandon has \$175.00 to spend on new clothes to start the school year. He purchases 2 pairs of jeans for \$24.95 each, 3 shirts for \$12.50 each, and a pair of shoes for \$70.00. How much money does Brandon have left?
5. Juanita and Jorge are paid a total of \$2,400 to paint a house. If Juanita earns twice as much as Jorge, how much is Jorge paid?	6. What is the total amount paid for a new sofa that costs \$899.00 if sales tax is 6%?
7. What is the sale price of an item marked 40% off if the original price was \$12.95?	8. How many cartridges of printer ink can be purchased with \$100.00 if each cartridge costs \$16.99?

Name: _____ Date: _____

Unit 1: The Mathematics of Lemonade Stands

Real-World Application

If you like to work with friends or family while meeting new people and making money, operating a lemonade stand might be a great thing to do. As with many adventures in life, running a lemonade stand requires the use of mathematics, and we will explore some of that mathematics in this unit.

The ingredients for a basic lemonade recipe are as follows:



Basic Lemonade Recipe

6 lemons
 $\frac{3}{4}$ cup sugar
 $1\frac{1}{2}$ quarts water



When determining approximately how much lemonade the recipe makes, you look at only the amount of water used. In this case, the recipe makes approximately $1\frac{1}{2}$ quarts of lemonade.

Directions: Using this recipe as a guide, imagine that you and some friends open a lemonade stand in your neighborhood. Work through the exercises that follow to explore what it takes to succeed.

1. At the local market, lemons are priced 5 for \$2.00. What is the unit cost per lemon?

2. A bag containing 9 cups of sugar sells for \$2.25. How much does each cup of sugar cost?
