Table of Contents

Introduction

Approaching Math Content—Today's Standards

The Common Core State Standards address several important goals in education:

- to prepare students for college and careers
- to develop critical-thinking and analytical skills students need for success
- to help teachers measure student progress and achievement throughout the year

The Common Core Mathematics Standards seek to provide teachers and students with focused mathematics instruction. The standards are designed to deepen students' understanding as they progress through grade levels and topics.

Mathematics is a subject in which concepts build in a progression. A strong foundation of basic concepts must be laid, beginning in the early grades. The Common Core State Standards recognize this learning sequence. Mathematical thinking is divided into several broad categories, referred to as "domains." Elementary grades address the same general domains, with specific standards for student understanding and achievement within each domain. For grades 1–5, these domains include Operations & Algebraic Thinking, Number & Operations in Base Ten, Number & Operations—Fractions (begins in grade 3), Measurement & Data, and Geometry.

It is important for students to understand the role mathematics plays in everyday life. The Common Core Mathematics Standards encourage students to apply their mathematical knowledge to real-world problems and situations. Teachers, in turn, assess student understanding and mastery of concepts by asking them to explain their thinking and justify their answers. Word problems provide students with opportunities for the practical application of mathematical concepts.

This book presents word problems in a realistic setting. Students dig into the content of each "scenario" as they apply math concepts to solve multiple problems. Each unit is designed to encourage students to read for understanding, revisit content on a variety of levels, and use information as a tool for solving more complex problems.

Establishing Mathematical Practices

The Common Core Standards for Mathematical Practice (SMP) describe practices students can implement to help them engage with mathematical content. As your students work through the activities in this book, encourage them to develop these habits as they practice and develop problem-solving skills.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

These practices help students understand core mathematical concepts so they can apply a variety of strategies for successful problem solving. As students learn underlying principles, they will be able to . . .

- consider similar problems.
- represent problems in ways that make sense.
- justify conclusions and explain their reasoning.
- apply mathematics to practical situations.
- use technology to work with mathematics.
- explain concepts to other students.
- consider a broad overview of a problem.
- deviate from a known procedure to use an appropriate shortcut.
- reason and explain why a mathematical statement is true.
- explain and apply appropriate mathematical rules.

Help your students and their families find success. Work with administrators, other teachers, and parents to plan and hold math-coaching nights for parents. The tips on page 6 may be helpful for parents as they work with students at home. Consider photocopying the page to send home in students' homework folders to aid with math assignments. Additionally, prepare a visual aid to help parents understand students' work in math. Share this aid with parents at back-to-school night or on other occasions when they visit the classroom.

How to Use This Book

This book contains several mathematical problem-solving units. Each unit gives students the opportunity to practice and develop one or more essential mathematical skills. Units are grouped by domains—although within a unit, more than one domain may be addressed. Within each domain, math concepts build on one another, forming a foundation for student learning and understanding. In addition to the Common Core Mathematics Standards covered in this book, the passages that accompany each unit meet one or more English Language Arts Standards as they provide practice reading appropriate literature and nonfiction text.

About the Units

Each unit is three pages in length. Depending on the needs of your students, you may wish to introduce units in small-group or whole-class settings using a guided-to-independent approach. Reading the passages and responding to activities in collaborative groups allows students to share and support their problem-solving results. As an alternative, students can work independently and compare responses with others. Whichever method you choose, the reading and math activities will provide students with the tools they need to build mathematical knowledge for today's more rigorous math standards.

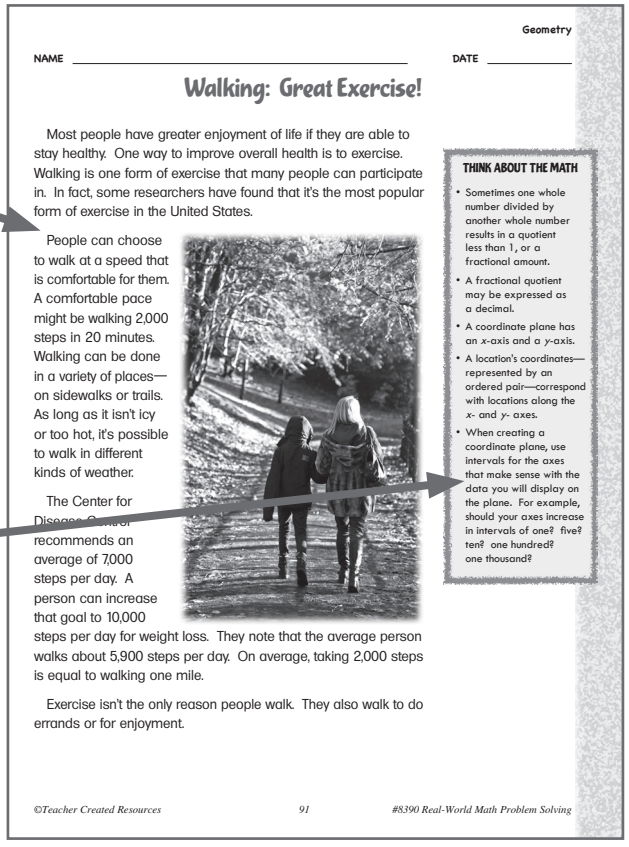
Page 1

All units begin with a reading passage that presents a mathematical problem or situation. Engaging nonfiction and fiction passages are included in the book. Passages are age-level appropriate and fall within a range of 830 to 1010 on the Lexile scale.

Each passage incorporates information to be used for solving practical math problems. They also allow students to experience a variety of genres and make meaningful connections between math and reading.

Students practice reading skills as they read for understanding, revisit text on a variety of levels, and use passage information as a tool for solving more complex problems.

Sidebars provide tips to help students think about how to do the math. In addition, they offer tools or strategies students can use throughout the problem-solving process.



Geometry

NAME _____ DATE _____

Walking: Great Exercise!

Most people have greater enjoyment of life if they are able to stay healthy. One way to improve overall health is to exercise. Walking is one form of exercise that many people can participate in. In fact, some researchers have found that it's the most popular form of exercise in the United States.

People can choose to walk at a speed that is comfortable for them. A comfortable pace might be walking 2,000 steps in 20 minutes. Walking can be done in a variety of places—on sidewalks or trails. As long as it isn't icy or too hot, it's possible to walk in different kinds of weather.

The Center for Disease Control recommends an average of 7,000 steps per day. A person can increase that goal to 10,000 steps per day for weight loss. They note that the average person walks about 5,900 steps per day. On average, taking 2,000 steps is equal to walking one mile.

Exercise isn't the only reason people walk. They also walk to do errands or for enjoyment.

THINK ABOUT THE MATH

- Sometimes one whole number divided by another whole number results in a quotient less than 1, or a fractional amount.
- A fractional quotient may be expressed as a decimal.
- A coordinate plane has an *x*-axis and a *y*-axis.
- A location's coordinates—represented by an ordered pair—correspond with locations along the *x*- and *y*- axes.
- When creating a coordinate plane, use intervals for the axes that make sense with the data you will display on the plane. For example, should your axes increase in intervals of one? five? ten? one hundred? one thousand?

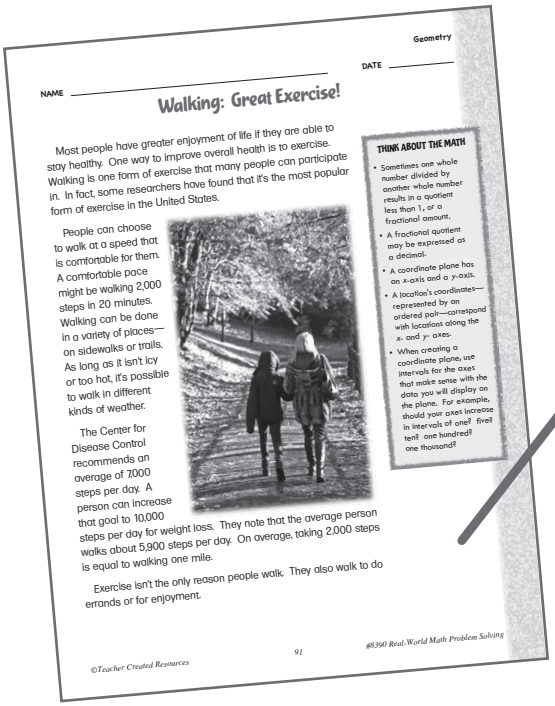
How to Use This Book *(cont.)*

About the Units *(cont.)*

Page 2

The second page of each unit introduces problem-solving tasks. Space is provided for students to draw pictures, work out their answers, write equations, show their work, and explain their thinking. Students are asked to use the unit passage to respond to reading content and investigate the text in order to find solutions to the problems on the page.

The questions require students to look back at the text for clues and information that relates to each question. They must then interpret this information in a way that helps them solve each task on the page. In doing so, students learn to support their responses with concrete evidence.



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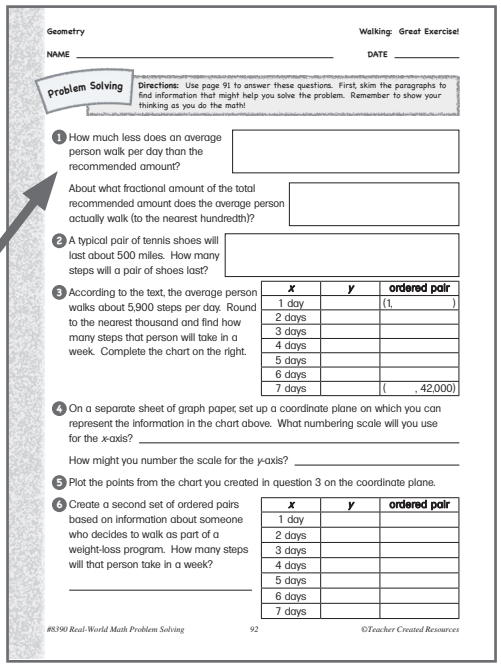


Geometry — Walking: Great Exercise!

NAME _____ DATE _____

Problem Solving Directions: Use page 91 to answer these questions. First, skim the paragraphs to find information that might help you solve the problem. Remember to show your thinking as you do the math!

1. How much less does an average person walk per day than the recommended amount?

   About what fractional amount of the total recommended amount does the average person actually walk (to the nearest hundredth)?

2. A typical pair of tennis shoes will last about 500 miles. How many steps will a pair of shoes last?

3. According to the text, the average person walks about 5,900 steps per day. Round to the nearest thousand and find how many steps that person will take in a week. Complete the chart on the right.

x	*y*	ordered pair
1 day		(1,)
2 days		
3 days		
4 days		
5 days		
6 days		
7 days		(, 42,000)

4. On a separate sheet of graph paper, set up a coordinate plane on which you can represent the information in the chart above. What numbering scale will you use for the *x*-axis? _____

   How might you number the scale for the *y*-axis? _____

5. Plot the points from the chart you created in question 3 on the coordinate plane.

6. Create a second set of ordered pairs based on information about someone who decides to walk as part of a weight-loss program. How many steps will that person take in a week? _____

x	*y*	ordered pair
1 day		
2 days		
3 days		
4 days		
5 days		
6 days		
7 days		

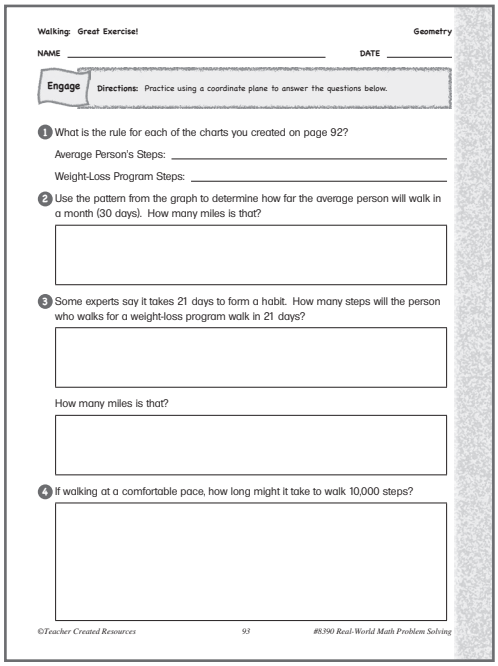
#8390 Real-World Math Problem Solving 92 ©Teacher Created Resources

Page 3

The *Engage* option extends the mathematical situation with questions that allow students to look back at the reading passage and use critical-thinking skills.

The activities in this section strengthen students' comprehension skills by posing questions or situations for which further reflection of the text is required. Questions may be open-ended and require higher-level thinking skills and supported responses. Activities in this section focus on a combination of reading and math skills.

While students can respond independently to the activities on this page, you may wish to have them discuss their answers with a partner, in a small group, or with the entire class. This method can also provide closure to the unit.



Walking: Great Exercise! — Geometry

NAME _____ DATE _____

Engage Directions: Practice using a coordinate plane to answer the questions below.

1. What is the rule for each of the charts you created on page 92?

   Average Person's Steps: _____

   Weight-Loss Program Steps: _____

2. Use the pattern from the graph to determine how far the average person will walk in a month (30 days). How many miles is that?

3. Some experts say it takes 21 days to form a habit. How many steps will the person who walks for a weight-loss program walk in 21 days?

   How many miles is that?

4. If walking at a comfortable pace, how long might it take to walk 10,000 steps?

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