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Introduction

This book is designed around the standards from the National Council of Teachers of Mathematics (NCTM) with a focus on  problem solving. Students will build new mathematical knowledge, solve problems in context, apply and adapt appropriate strategies, and reflect on the problem-solving process. At the same time, students will utilize skills from the NCTM content standards:

- Number and Operations
- Algebra
- Geometry
- Measurement
- Data Analysis and Probability

The NCTM process standards are also incorporated throughout the activities. The correlation chart on page 6 identifies the pages on which each NCTM standard appears. Also look for the following process icons on each page:



Problem Solving



Communication



Reasoning and Proof



Connections



Representation

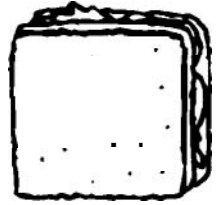
Problem-Solving Challenge: This short pretest contains a representative sampling of problem-solving activities similar to those used throughout this book. Give this pretest all at one time, or present one problem at a time over a series of days. Teachers may choose to assign these problems to individuals, pairs, or groups.

The purpose of the pretest is to provide insights into the thought processes and strategies students already possess. The emphasis should not be on the number of “right” answers. Instead encourage students to try their best and write down their ideas. These problems can also provide opportunities for class discussion as students share their thought processes with one another.



Divide It Up

1. Justin forgot his lunch at home. His friend David shared his lunch with him. David had 1 sandwich, 24 grapes, 6 cookies, and an 8-ounce carton of milk. Divide David's lunch so that they both get the same amount. Describe how you divided the lunch.



2. Old MacDonald has a farm. Many people leave their animals at his farm. MacDonald is outside one morning scratching his head. He knows he has too many animals.

- a. He owns only 12 chickens. Now he has half as many more. How many chickens are there now? _____
- b. He has double the number of horses, which is usually 18. How many horses are not his? _____
- c. Suggest some ways you could have found the answer.

Think



What do half **as many more** and **double** mean?

Answer Key

Problem-Solving Challenge 7-8

1. $5,000 + 200 + 30 + 4$

2 a $22 + 2 = 24$

b. $26 - 2 = 24$

c $12 + 12 = 24$

3 $\frac{1}{4}$

4-5. Answers will vary.

6 a feet

b inches

c yards

7. Pictograph should reflect data shown.

The number of 100% tests increases.

Place Value 9

1. \$600.00; six hundred dollars

2 a 71 years old

b. $70 + 1$

c Answers will vary.

3 a 9,521

b. $9,000 + 500 + 20 + 1$

c nine thousand, five hundred twenty-one

Number Combinations 10

1. Answers will vary.

2 9,531

3 3,579

Rounding Numbers. 11-12

1. a 130

b 50

c 70

d 80

e 20

f 70

g 40

h 30

2 a 100

b 100

c 200

d 800

e 500

f 300

g 300

h 400

3. \$20.00; \$17.00; \$39.00; \$10.00

4. \$86.00; \$85.85; \$0.15

5. \$40.00

6. \$9.16; \$9.00

7. \$49.00

8. \$48.91

9. Buying is \$37.00 more.

10. Answers will vary.

Putting Numbers Together 13

1. 6 combinations; 358,385,538,583,835,853

2 6 ways

3-4. Answers will vary.

Adding Odd and Even 14

1. a 10; 86; 76; 3,546

b even

2 a 660; 32; 100; 6,134

b even

3 a 67; 33; 571; 1,175

b odd

Subtracting Odd and Even 15

1. even, 2, 6, 6, 1, 108

2 even, 2, 6, 122, 1,620

3 odd, 5, 25, 137, 1,355

4. Answers will vary.

