AfterMath™

BOOK

C

Name _____

Dear Student,

Welcome to *AfterMath*™, a program that allows you to explore mathematics. Inside this book are 36 activities. In these activities, you will play math games, conduct experiments, solve problems, and write and perform "math magic."

AfterMath is designed to allow you to work alone, with a partner, or in a small group. You will try a variety of activities. By doing these activities, you will develop your math skills. You will look at math in new ways. You also will find that math is part of your everyday life.

Some activities use skills that you already know. Other activities add to known skills. Still other activities provide challenges. But, the goal for each activity is to have fun and to learn at the same time.

A famous man named Galileo once said that mathematics is the alphabet in which the universe was created. So, enjoy the activities and begin learning that "alphabet"!

P.S. You may want to have materials such as the following on hand: pencils and erasers, scratch paper, a calculator, a customary ruler, and a metric ruler.

This *AfterMath* book was prepared for students by Christopher Forest.

Designed and illustrated by Jamie Ruh

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| ACTIVITY	Page

TEETER-TOTTERING

Students in Mr. Murphy's third-grade class are using seesaws to learn about balance. One student will sit on one end of a seesaw. On the other end, Mr. Murphy will place weights (such as those shown below). Draw and label the weights that are needed to balance each seesaw. (The weights that you draw will be smaller than those shown below.)

1

1-pound weight

5
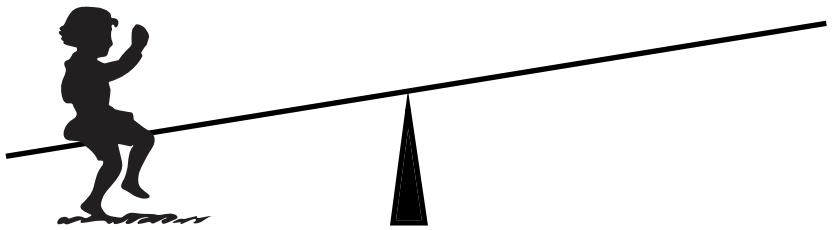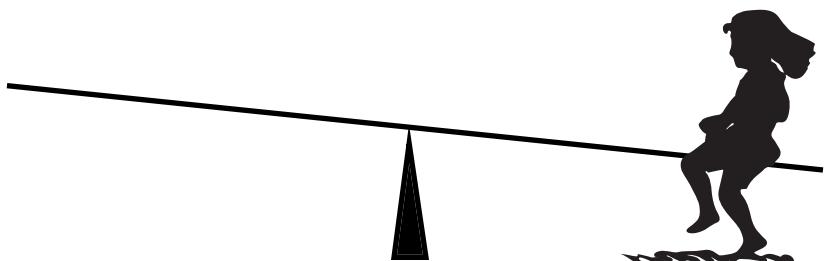
5-pound weight

10

10-pound weight
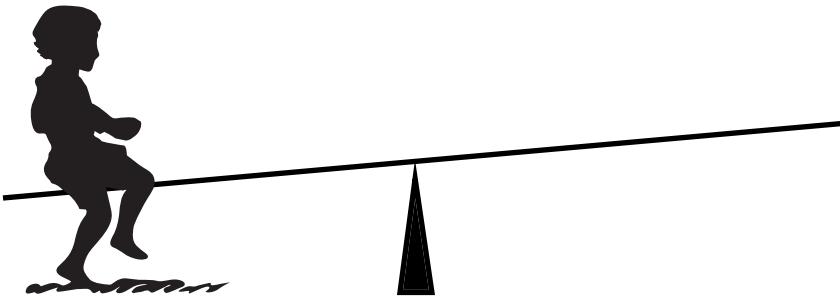
SEESAW ONE: Jacob weighs 45 pounds. He is on one end of Seesaw One. Mr. Murphy placed 5 weights on the other end. Draw and label the weights that Mr. Murphy used to make the seesaw balance.

**SEESAW TWO:** Trina weighs 56 pounds. She is on one end of Seesaw Two. Mr. Murphy placed 7 weights on the other end. Draw and label the weights that he used to make the seesaw balance.

**SEESAW THREE:** Lian weighs 61 pounds. He is on one end of Seesaw Three. Mr. Murphy placed 8 weights on the other end. Draw and label the weights that he used to make the seesaw balance.

CHECKOUT
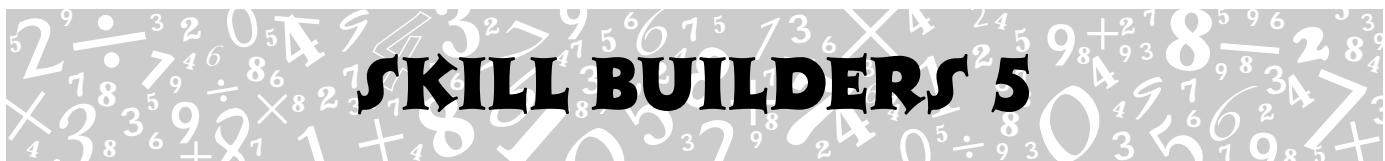
Each symbol stands for a different number. Use the problems to determine the number that each symbol stands for.

PROBLEM 1	◖	+	◖	+	◖	=	6	
PROBLEM 2	◖	+	◆	+	◆	=	10	
PROBLEM 3	◖	+	◆	+	☆	=	13	
PROBLEM 4	☆	+	⇨	+	◖	=	12	
PROBLEM 5	❏	+	◆	+	⇨	=	8	
PROBLEM 6	⇨	+	❋	+	⇨	=	14	
PROBLEM 7	▮	+	❏	+	❏	=	11	
BONUS PROBLEM	▼	+	▼	+	▼	=	▮ + ◆ + ❏ + ❏	

1. *What number does each symbol stand for?*

◖ = _____   ◆ = _____   ☆ = _____   ⇨ = _____

❏ = _____   ❋ = _____   ▮ = _____   ▼ = _____

2. *Write your own problem using the symbols above. Do not use any numbers!*

SKILL BUILDERS 5

Two's Are Few

Below are two groups of 2. Each group is missing one addition symbol (+) and one subtraction symbol (–). Place the symbols to get the answers shown. To make a number of two or more digits, leave the space between the numbers empty.

a. 2   2   2   2   2   =   2

b. 2   2   2   2   2   =   222

Patterns, Patterns, Patterns

Figure out the pattern in each group of numbers. Write the next three numbers to complete the pattern. Then describe the pattern.

a. 2   7   12   17   22   ____   ____   ____

Pattern: _____

b. 36   33   30   27   24   ____   ____   ____

Pattern: _____

c. 5   10   20   40   80   ____   ____   ____

Pattern: _____

Missing Parts

Each pattern below is missing parts. Study each pattern and fill in the parts.

a. 1   3   5   ___   ___   11   13

b. 1:15 P.M.   1:30 P.M.   1:45 P.M.   ___   ___   2:30 P.M.

c. ●   ○   ■   ___   ___   Δ

d. 2   4   8   ___   ___   64   128

e. 600   40   2   642   ___   ___   3   753

JUST DESSERTS

Read the word problems in Column A. Then match each number sentence in Column B with the word problem that it solves. The first one has been done for you.

Column A

1. __g__ Leroy picks a dozen buckets of berries every day. How many buckets of berries will he have in 6 days?
_____72_____

2. _____ Ellie buys eggs for each berry cake. Each cake needs 4 eggs. Each carton of eggs holds a dozen eggs. How many cakes can be made with 1 carton? _____

3. _____ Chen buys frosting for the cakes. Each can of frosting has enough frosting for 4 cakes. How many cakes can be covered with 12 cans of frosting? _____

4. _____ Jill puts cups of flour into the cake batter. Each bowl of cake batter uses 10 cups of flour. How many cups of flour are needed to make 6 bowls of batter? _____

5. _____ Diaz puts 6 handfuls of berries into each small cake. He puts 12 handfuls of berries into each large cake. How many total handfuls of berries does he need for 1 small cake and 1 large cake? _____

6. _____ Larry puts the cakes into boxes. In his first hour of work, he packaged 10 cakes. In his second hour of work, he packaged 12 cakes. How many more cakes did he package in his second hour than in his first hour?_____

7. _____ Connie sells the cakes. She sells 4 cakes each day. How many cakes can she sell in 10 days? _____

8. _____ Cosmo has 10 berry cakes. He gives away 6 cakes as gifts. How many cakes are left? _____

Column B

a. $12 \div 4 = \square$

b. $6 + 12 = \square$

c. $10 \times 6 = \square$

d. $12 - 10 = \square$

e. $10 - 6 = \square$

f. $12 \times 4 = \square$

g. $12 \times 6 = \square$

**h.** $10 \times 4 = \square$
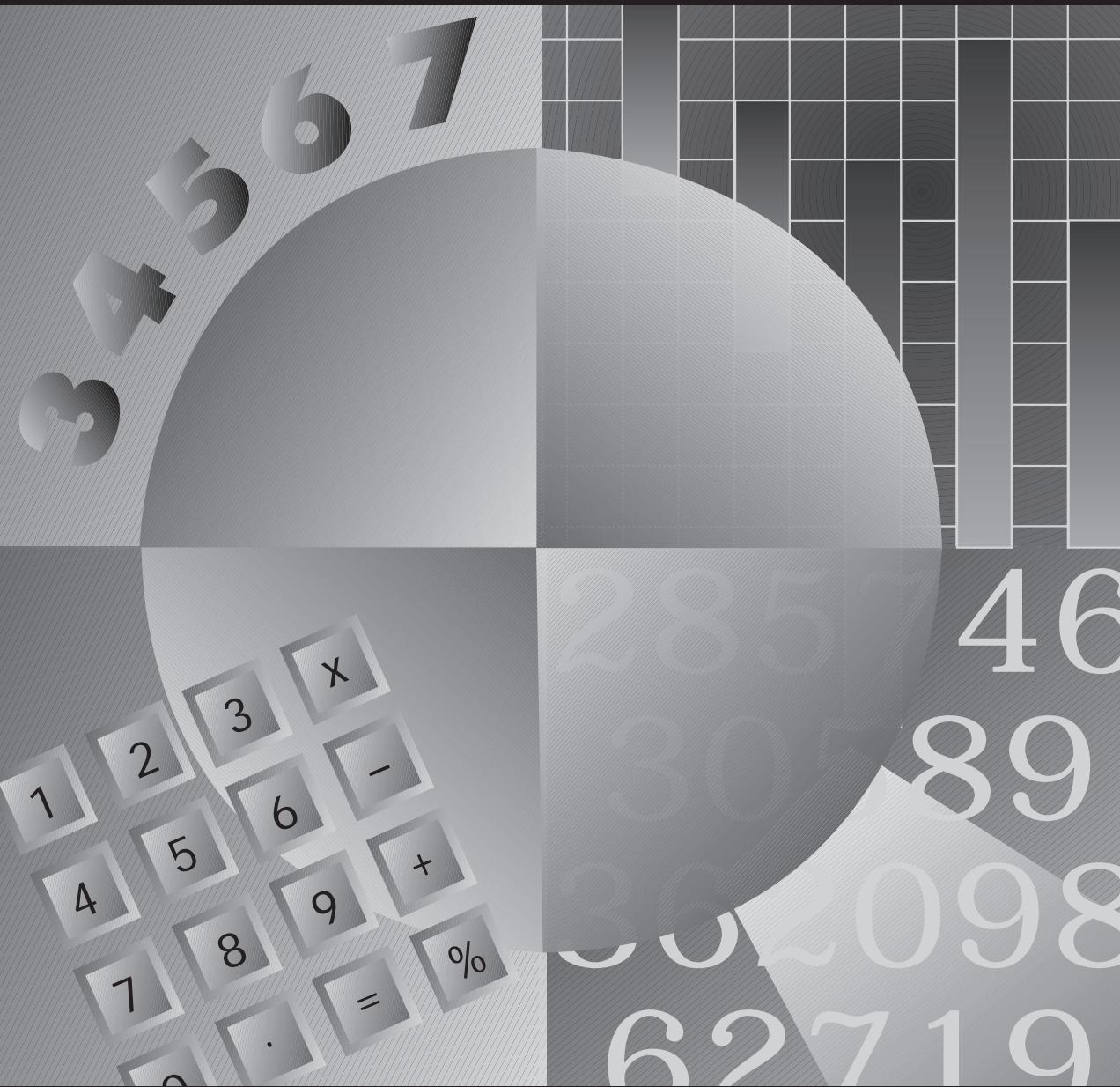
TEACHER GUIDE

AfterMath™

BOOK

C

Dear Teacher,

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The activities in the *AfterMath* student book are based on seven strands, six of which are set forth in the standards developed by the National Council of Teachers of Mathematics. The strands are numeration, number theory, measurement, geometry, prealgebra, data interpretation, and logical reasoning. A list of activities and the skills covered appears on the next two pages.

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The activities provide a variety of experiences for students, including writing, computing, experimenting, completing small projects, conducting research, and playing games. An icon 💡 marks challenging creative-thinking items. Students will become aware that mathematics is not reserved just for the classroom; it is a vital part of the world around them.

Try to preview all thirty-six activities in the student book before assigning particular activities. Students may complete the activities in any order that fits your needs. Note that some math experiments require the use of basic hands-on materials such as calculators, number cubes, playing cards, dominoes, and rulers (customary and metric).

AfterMath, Book C is designed specifically for students in third grade. However, the activities can be used with advanced mathematics students in second grade, as well as with students who require mathematics skills reinforcement in fourth grade.

Enjoy the activities. Encourage students to do as many as possible. Galileo once said that mathematics is the alphabet in which the universe was created. So, let's begin to learn that alphabet.

Author: Christopher Forest

Editor: Dale Lyle

Designer: Jamie Ruh

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Activity   **Page**

(continues)

N: Numeration	G: Geometry	LR: Logical Reasoning
NT: Number Theory	PA: Prealgebra	
M: Measurement	DI: Data Interpretation	

SPHERE ME (SB page 23)

Rows and Rows:
See sample illustrations:

Spheres and Spheres:
golf ball, globe, beach ball, orange, basketball

Sphere List: Answers will vary. Sample answers: all of the above objects plus: marble, pool ball, sun, soccer ball, baseball, cantaloupe, gum ball, ball bearing, pea

THERE IT IS (SB page 24)

Circles:

1. No; although it looks like there is a triangle, there is no real figure there.
2. The trick (illusion) is created by the indented angles in the three circles, which seem to create a triangle.

Lines:

1. Students will probably guess that a is the shortest and that c is the longest. However, all the lines are of equal length.
2. The trick (illusion) is created by the outward and inward arrows on a and c, respectively.

ON EDGE (SB page 25)

1. **Cube:** 12 edges, 6 faces
   Pyramid: 8 edges, 5 faces
   Sphere: 0 edges, 0 faces
   Rectangular Prism: 12 edges, 6 faces
2. Sample answers:
   Cube: number cube
   Pyramid: paperweight
   Sphere: baseball
   Rectangular Prism: shoebox

TEETER–TOTTERING (SB page 26)

Seesaw One—four 10-pound weights (semicircles) and one 5-pound weight (triangle)

Seesaw Two—five 10-pound weights (semicircles), one 5-pound weight (triangle), and one 1-pound weight (square)

Seesaw Three—five 10-pound weights (semicircles), two 5-pound weights (triangles), and one 1-pound weight (square)

CHECKOUT (SB page 27)

Symbol Problems:

1. ◯ = **2**

    ◆ = **4**

    ☆ = **7**

    ⇨ = **3**

    ❏ = **1**

    ✳ = **8**

    ▮ = **9**

    ▼ = **5**

2. Sample student problems:

    ▼ + ◯ + ◯ = ▮

    ▼ + ⇨ + ❏ = ▮

    ▼ = ❏ + ❏ + ⇨

SKILL BUILDERS 5 (SB page 28)

Two's Are Few:

a. 22 – 22 + 2 = 2
b. 2 – 2 + 222 = 222

Patterns, Patterns, Patterns:

a. 27, 32, 37
   Pattern: add 5
b. 21, 18, 15
   Pattern: subtract 3
c. 160, 320, 640
   Pattern: double

Missing Parts:

a. 7, 9
b. 2:00 P.M., 2:15 P.M.
c. ❏ , ▲
d. 16, 32
e. 700, 50

JUST DESSERTS (SB page 29)

1. = g
2. = a
3. = f
4. = c
5. = b
6. = d
7. = h
8. = e

INS AND OUTS (SB page 30)

Make It Work

1. a. 12 + 4 = 16
   b. 9 – 4 = 5
   c. 3 + 4 = 7
   d. 7 – 1 = 6
   e. 5 + 5 = 10; 5 x 2 = 10
   f. 2 + 4 = 6; 2 x 3 = 6
2. Student problems will vary.

TREASURE HUNT (SB page 31)

1. I
2. C
3. E
4. C
5. R
6. E
7. A
8. M
9. M
10. ICE CREAM

PUTTING IT IN ORDER (SB page 32)

Sack Race:

A. Sharks	B. Eagles	C. Tigers
2nd place team	3rd place team	1st place team
1. Andrew	1. Tia	1. Jennae
2. Gabe	2. Lin	2. Sarah
3. Tobias	3. Jess	3. Judi

That Is the Question: Questions and graphs will vary.

THE TIME MACHINE (SB page 33)

Saturday Night:
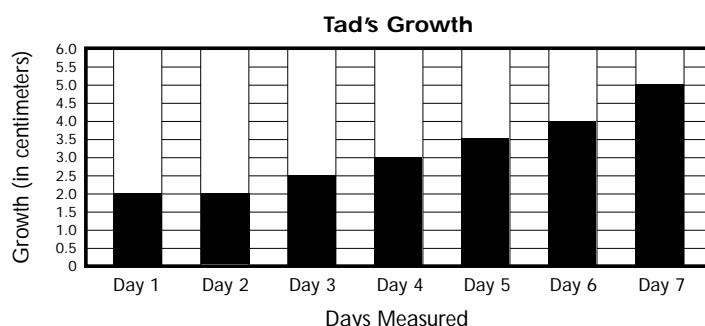
1. Your Show of Shows—1 hour and 30 minutes
2. Week in Review, Faye Emerson, Your Hit Parade
3. One Man's Family
4. CBS
5. All-Star Revue
6. NBC—Your Hit Parade
7. Sing It Again
8. TV Teen Club

2005 Guide: Schedules and questions will vary.

SKILL BUILDERS 6 (SB page 34)

The Winner:

1st: Dana
2nd: Stephanie
3rd: Vini
4th: Leah
5th: Jacob
6th: Luis
7th: Nora
8th: Katie
9th: Markel

Graphing It:

1. green, orange
2. red: 12
   yellow: 10
   green: 15
   orange: 5
3. 42
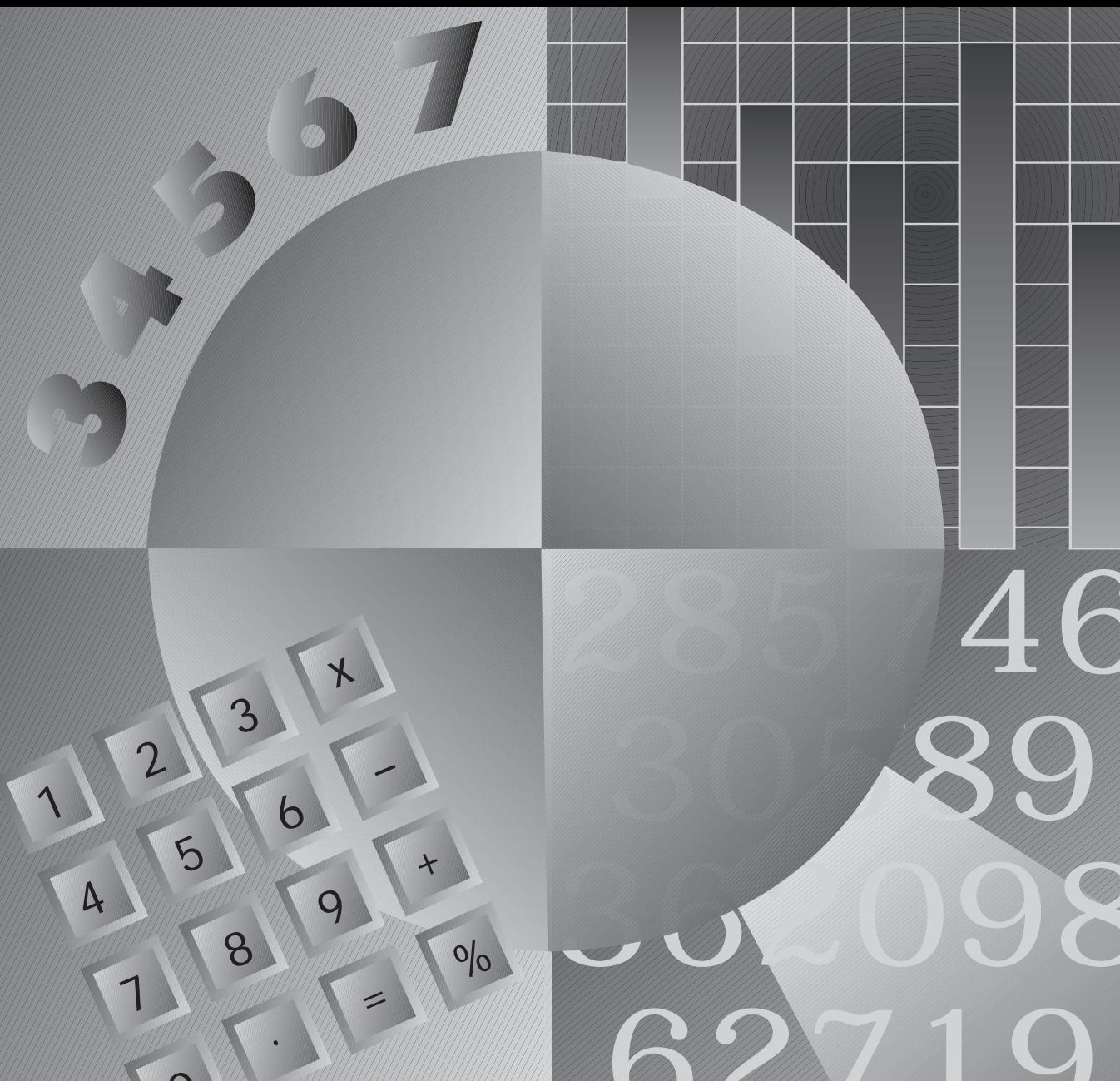
TRACKING DATA (SB page 35)

*Daily Weather:* Charts, answers, and comparisons will vary.

Tad the Tadpole: See graph:

Tad's Growth

AfterMath

B O O K

D

Name _____

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TOUGH TWENTIES

Out of the Box

On each line, use the circled digit to make the number 20. You can add, subtract, multiply, or divide. You may use the digit up to eight times. Use the correct order of operations. A sample has been done for you.

1. 11 + 11 – 1 – 1 _____ = 20

2. _____ = 20

3. _____ = 20

4. _____ = 20

5. _____ = 20

6. _____ = 20

7. _____ = 20

8. _____ = 20

9. _____ = 20

10. _____ = 20

Numbers in History
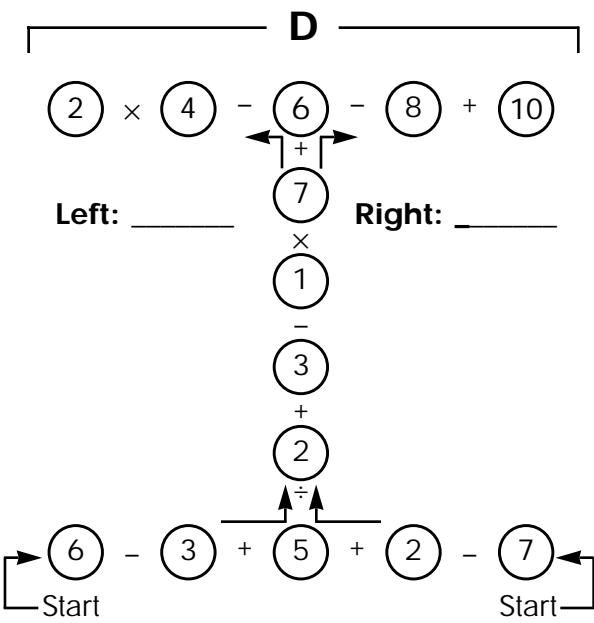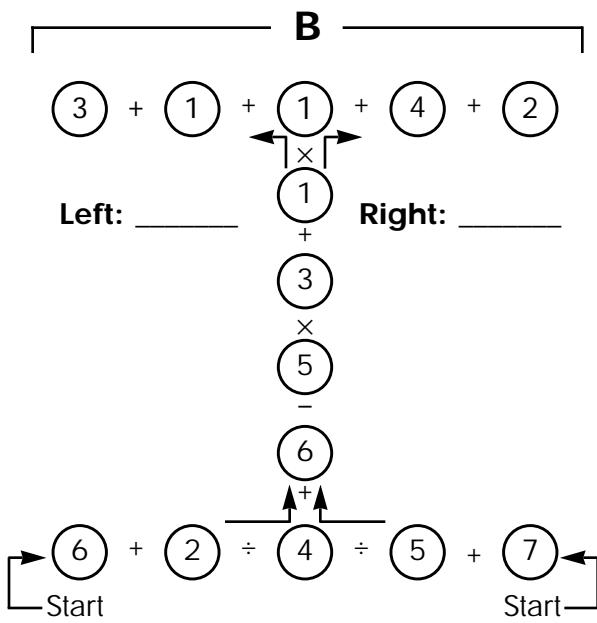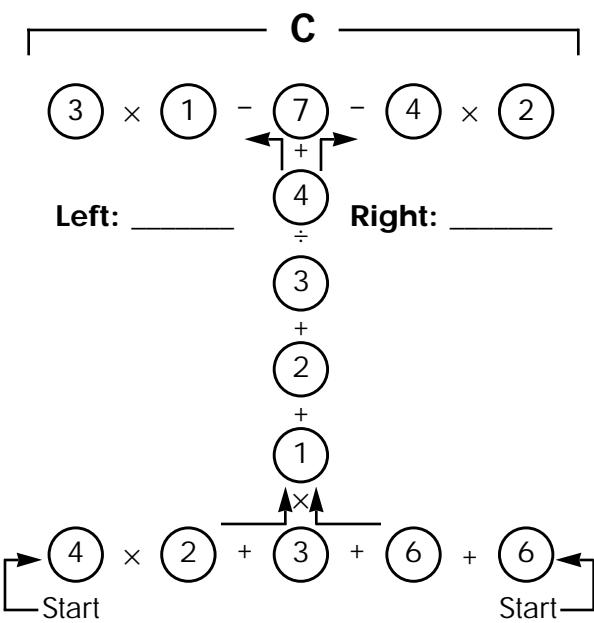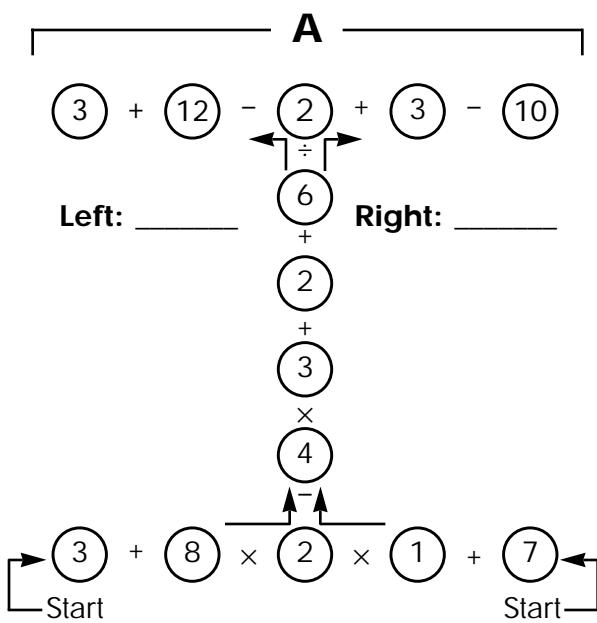
Abraham Lincoln's Gettysburg Address opened with "Four score and seven years ago." This opening line refers to a certain number of years.

1. How many years are in a score? _____

2. How many years are in four score and seven years? _____

3. What year was Lincoln referring to if he made the speech in 1863? _____
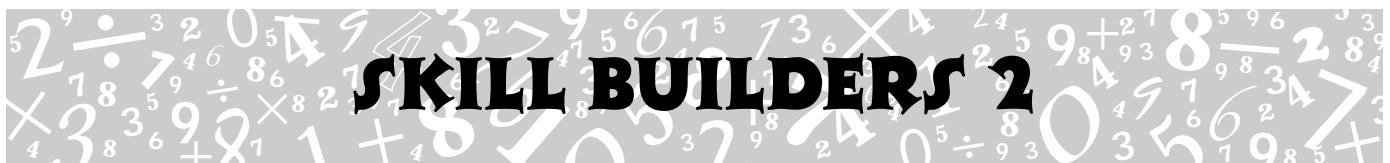
1. *For each I-shaped figure, begin at Start and do the operations in the order shown. Follow the arrows in, up, and out. Do this on both sides of the I. Use the middle column of the I for both sides. Write the total for the left side and the total for the right side.*

A

3 + 12 − 2 + 3 − 10

÷

6

+

2

+

3

×

4

−

3 + 8 × 2 × 1 + 7

Start   Start

Left: _____   **Right:** _____

C

3 × 1 − 7 − 4 × 2

+

4

÷

3

+

2

+

1

×

4 × 2 + 3 + 6 + 6

Start   Start

Left: _____   **Right:** _____

B

3 + 1 + 1 + 4 + 2

×

1

+

3

×

5

−

6

+

6 + 2 ÷ 4 ÷ 5 + 7

Start   Start

Left: _____   **Right:** _____

D

2 × 4 − 6 − 8 + 10

+

7

×

1

−

3

+

2

÷

6 − 3 + 5 + 2 − 7

Start   Start

Left: _____   **Right:** _____

2. *On each I, circle the side with the greater answer.*

SKILL BUILDERS 2

The Missing Number

Study the diagram to figure out the number pattern. What number is missing? _____
What is the pattern?_____

4	5	1
2		3
4	0	6

Bee Eye Dee Eff Eye

Each letter represents a number.

1. Replace the letters with numbers to complete the problems. Hints: d = 7, i = 5

```
    d i d              f, i f i
  + d i b      +     – b i b       – 
  ─────────                ─────────      ──────────
    f, i f i              l i d
```

2. What number does each letter represent? d __7__ , i __5__ , b ___ , f ___ , l ___

Lunch Time

Five students are waiting in line to buy lunch. Read the clues about each. Then list
the students in order from first to last (first to fifth) in line.

Clues: KATIE: I am behind someone, but it isn't a boy.
TIM: I'm not at the end of the line.
KYLE: Tim is behind me.
ANDREA: No one is in front of me.
DIEGO: Two students are between Katie and me.

First _____

Second _____

Third _____

Fourth _____

Fifth _____

SUBTRACTION MAGIC

Quite a Trick

Try this trick on a friend.

STEP ONE: Have a friend write a number that has three different digits.

STEP TWO: Have your friend reverse the number and write the new number.

STEP THREE: Have your friend subtract the smaller number from the larger number, but not tell you the number. Tell your friend that this is the Answer Number.

STEP FOUR: Have your friend tell you the first digit of the Answer Number. (If the Answer Number is a two-digit number, use 0 as the first digit.)

STEP FIVE: Subtract the number in Step Four from 9. This will let you know the last digit of the Answer Number.

STEP SIX: The middle digit (or the first digit in a two-digit number) in the Answer Number is always 9.

STEP SEVEN: Tell your friend the Answer Number.

Try the trick several times. Then answer this question.

What do you know about the first and last digits of each Answer Number?

_____

_____

Calculator Creativity

Use a calculator to subtract the numbers. Turn the calculator upside down to find the word created by each answer. Arrange the answers in numerical order to find a hidden sentence made up of the words.

|	Answer	Word
a. 1,083 – 569 =	_____	_____
b. 9 – 2 – 3 – 3 =	_____	_____
c. 3,315 – 2,980 =	_____	_____
d. 37,108 – 10,000 – 20,000 =	_____	_____
e. 1,020 – 27 =	_____	_____
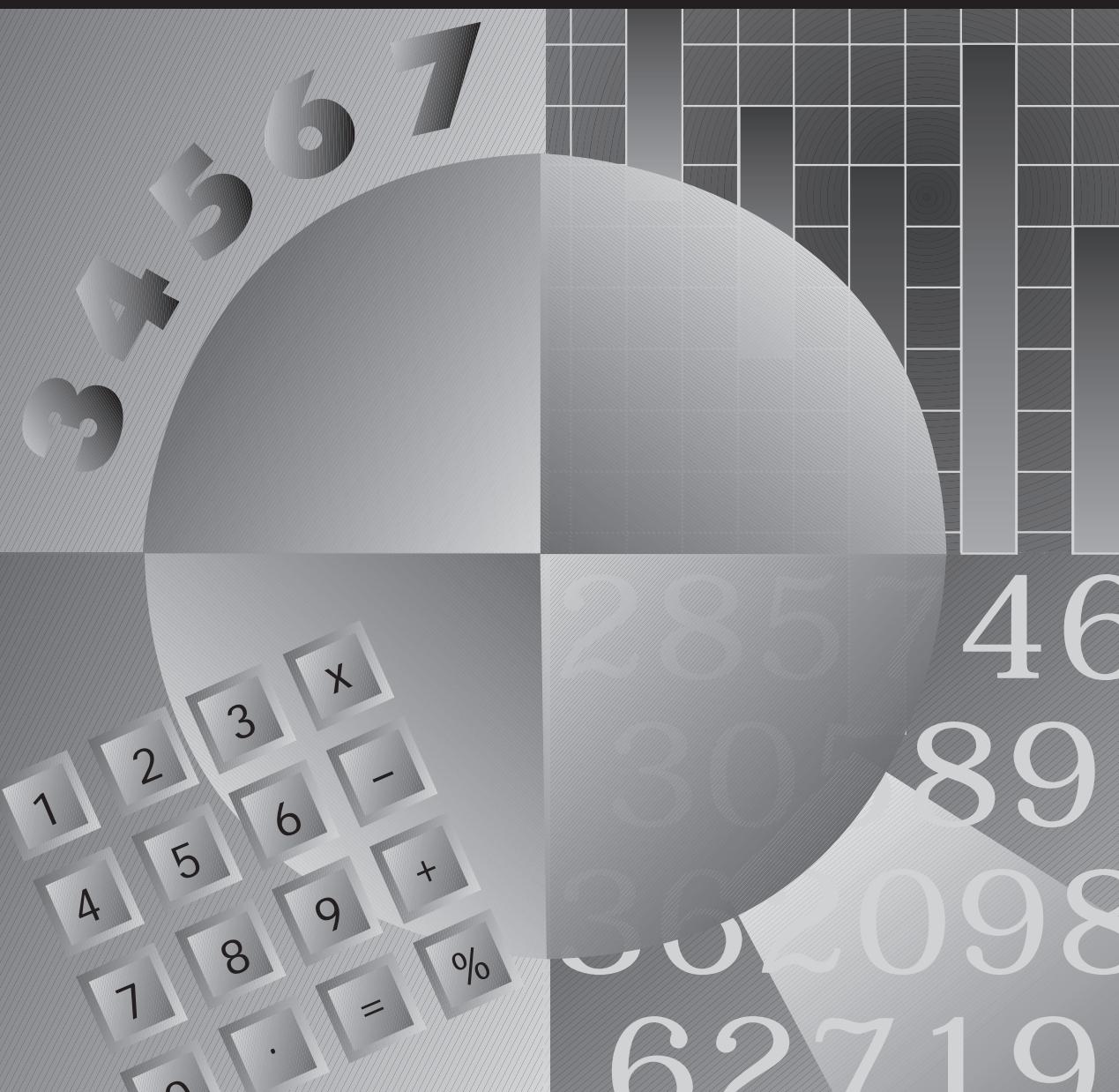
The hidden sentence is: _____.

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(continues)

N: Numeration	G: Geometry
NT: Number Theory	PA: Prealgebra
M: Measurement	DI: Data Interpretation

Answers

PLACES EVERYBODY (SB page 2)

Group One: 915
Group Two: 348
Group Three: 726

NAME THAT DIGIT! (SB page 3)

Missing Digit: The player will always be able to identify the missing digit.

Figure Me Out: 8

SKILL BUILDERS 1 (SB page 4)

Language of Numbers:

a. 3
b. 10
c. 13
d. 20
e. 365
f. 1
g. 0
h. 5
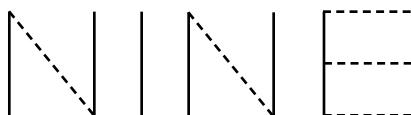
Common Numbers:

Group 1: All the numbers are between 20 and 30; all the numbers have a 2 in the tens place.

Group 2: All the numbers are multiples of 3; the sum of the digits in each number is a multiple of 3.

Group 3: All the numbers are primes.

When 6 + 5 Equals 9:

MIGHTY MATCH (SB page 5)

1.	935	9.	425
2.	600	10.	318
3.	198	11.	200
4.	913	12.	779
5.	575	13.	907
6.	734	14.	567
7.	892	15.	642
8.	271		

BUILDING NUMBERS (SB page 6)
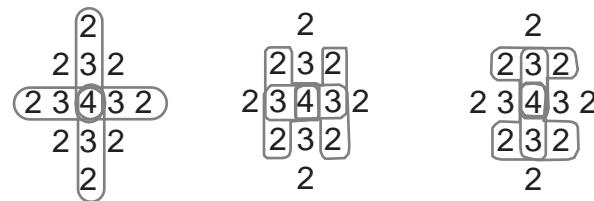
Same and Different:
Answers will vary. Sample answers:

Similarities—Both numbers are even; both numbers have four digits; both numbers have a 1 in the tens place; both numbers contain a 2.

Differences—The number on the right begins with an odd digit; the number on the left is smaller than the number on the right; the numbers have different digits in the thousands, hundreds, and ones places.

Any Which Way: There are twelve ways to read 234. See illustration:

NUMBER SENSE (SB page 7)

Answers will vary but should follow the sample given.

TOUGH TWENTIES (SB page 8)

Out of the Box:
Some answers will vary. Sample answers:

1. $11 + 11 - 1 - 1 = 20$
2. $22 - 2 = 20$
3. $(3 \times 3) + (3 \times 3) + (3 \div 3) + (3 \div 3) = 20$
4. $(4 \times 4) + 4 = 20$
5. $5 + 5 + 5 + 5 = 20$
6. $6 + 6 + 6 + (6 \div 6) + (6 \div 6) = 20$
7. $7 + 7 + 7 - (7 \div 7) = 20$
8. $(88 \div 8) + 8 + (8 \div 8) = 20$
9. $9 + 9 + (9 \div 9) + (9 \div 9) = 20$
10. $10 + 10 = 20$

Numbers in History:

1. 20
2. 87
3. 1776

THE I'S HAVE IT (SB page 9)

A   The left side (22) is greater than the right side (15).

B   The right side (19) is greater than the left side (14).

C   The left side (30) is greater than the right side (16).

D   The left side (88) is greater than the right side (57).

SKILL BUILDERS 2 (SB page 10)

The Missing Number:
The number is 5. The pattern is that the sum of the numbers in each row and column is 10.

Bee Eye Dee Eff Eye:

1.
```
   757          1,515
 + 758        –   858
 1,515            657
```
2. b = 8; d = 7; f = 1; i = 5; l = 6

Lunch Time: First—Andrea, Second—Katie, Third—Kyle, Fourth—Tim, Fifth—Diego

SUBTRACTION MAGIC (SB page 11)

Quite a Trick:
The sum of the first and last digits is always 9.
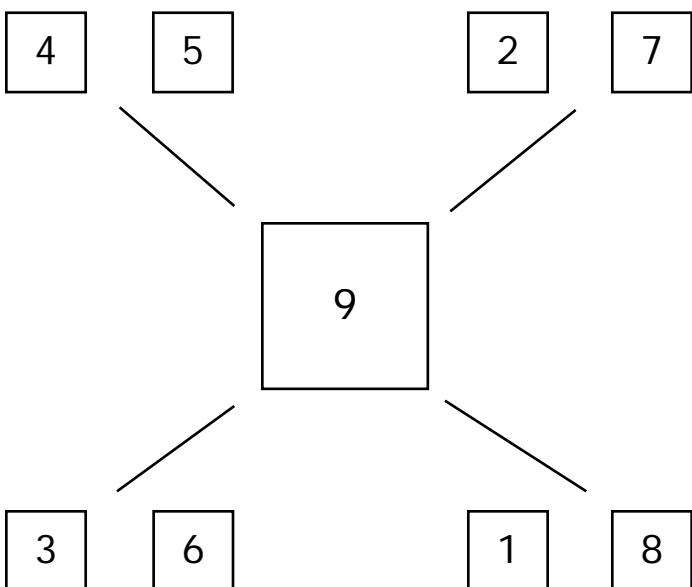
Calculator Creativity:

a. 514 = his
b. 1 = I
c. 335 = see
d. 7,108 = boil
e. 993 = egg

The hidden sentence is: I see his egg boil.

CARD CAPERS (SB page 12)

Card Connections:

Fifty-two Put Down: Game results will vary.

DO YOU FOLLOW? (SB page 13)

1. 6
2. 9
3. 59
4. 56
5. 14
6. 28
7. 56
8. 42
9. 14
10. 44
11. 31
12. 93
13. 100
14. 10
15. 6

The Answer Number is 6.

FOR THE CHILL OF IT (SB page 14)
Thermometer temperatures:

1. 47°F
2. 26°F
3. 44°F
4. 32°F
5. 29°F
6. 50°F
7. 35°F
8. 37°F
9. 40°F

Each thermometer should be shaded to the point of the temperature.

a. highest: 50°F
b. lowest: 26°F

ANT TRACKS (SB page 15)

Of Course:
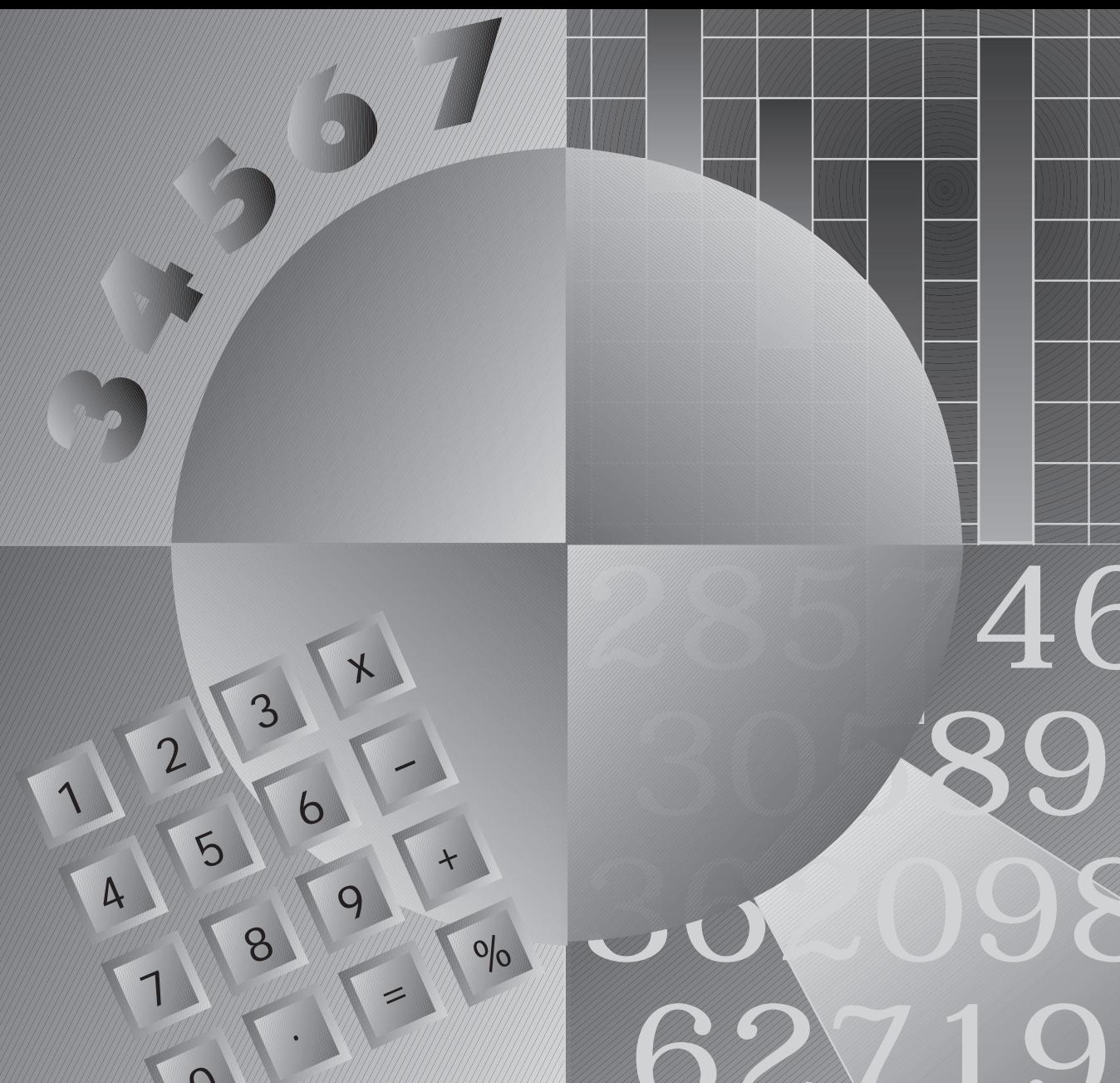
Course	Start Time	Finish Time	Total Time
1	4:15	4:20	5 min
2	12:00	12:08	8 min
3	8:50	9:05	15 min
4	5:25	5:45	20 min
5	3:30	4:15	45 min
6	1:15	2:35	1 hr 20 min
7	9:35	11:45	2 hr 10 min

AfterMath

Name _____

Dear Student,

Welcome to *AfterMath*™, a program that invites you to explore mathematics. Inside this book are 36 activities. In these activities, you will play math games, conduct experiments, solve problems, and perform "math magic."

AfterMath is designed to allow you to work alone, with a partner, or in a small group. You will try a variety of activities. By doing these activities, you will develop your math skills, and you will look at math in a new way—you will find that math is part of your everyday life.

Some activities use skills that you already know. Other activities add to known skills. Still other activities provide challenges. But, the goal is still always the same—to have fun and to learn at the same time.

A famous man named Galileo once said that mathematics is the alphabet in which the universe was created. So, enjoy the activities and begin learning that "alphabet."

P.S. You may want to have materials such as the following on hand: pencils and erasers, scratch paper, a calculator, a customary ruler, and a metric ruler.

This *AfterMath* book was prepared for students by Christopher Forest.

Designed and illustrated by Jamie Ruh.

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ACTIVITY	Page

LET'S GO A FEW ROUNDS

1. *Round each of the numbers in the first column to: the thousands place (Column A), the ten-thousands place (Column B), and the hundred-thousands place (Column C).*

	NUMBER	A ROUNDED TO THE THOUSANDS PLACE	B ROUNDED TO THE TEN-THOUSANDS PLACE	C ROUNDED TO THE HUNDRED-THOUSANDS PLACE
1.	189,217			
2.	246,709			
3.	314,289			
4.	75,216			
5.	905,213			
6.	678,217			
7.	8,124,214			
8.	956,212			
9.	600,956			
10.	189,717			

Taking a Closer Look

1. Circle the largest number in each row (1–10) in the chart above.

2. Tell the number of times that each column (A, B, or C) has the largest number.

Column A (the thousands place) _____

Column B (the ten-thousands place) _____

Column C (the hundred-thousands place) _____

3. The number 956,212 rounded to the hundred-thousands place is equal to the sum of five of the rounded numbers in Column C. What are the five numbers?

_____

_____

4. Round 678,217 to the ten thousands place. _____

Now write three other numbers that equal that same number when rounded to the ten thousands place. _____

SPEAKING OF NUMBERS

There are many different ways to express numbers. Read the different ways in which eight students describe some numbers. Write the number that you think each student is describing.

1. Chaz

"a dozen and a half"

_____

2. Nan

"forty-eight less than two hundred and twelve"

_____

3. Lara

"thirteen hundred sixty-one and four tenths"

_____

4. David

"nine hundred forty-five thousandths"

_____

5. Elizabeth

"five thousands plus two hundreds plus three tens plus two ones"

_____

6. Rien

"seven hundred twenty-two thousand, four hundred and eighty-five"

_____

7. Kaleb

"ninety-five point three seven two"

_____

8. Abraham

"four score and seven"

_____

SKILL BUILDERS 1

They Add Up

Use the clues to figure out the numbers.

CLUES: **NUMBERS:**

a. 3 consecutive counting numbers less than 30 that have a sum of 36: _____

_____

b. 4 consecutive even numbers less than 30 that have a sum of 36: _____

_____

c. 4 consecutive odd numbers less than 30 that have a sum of 56: _____

_____

d. 4 consecutive counting numbers less than 30 that have a sum of 66: _____

_____

e. 4 consecutive even numbers less than 30 that have a sum of 76: _____

_____

Number Match

Each phrase below is associated with a number from 1 to 10 (each number is used only once). Write the numbers on the lines after the phrases.

a. planets in the solar system ___   **f.** points of a snowflake ___

b. times a clock shows 12:00 daily ___   **g.** extra days in a leap year ___

c. lakes of the Great Lakes ___   **h.** days in a week ___

d. oceans of the world ___   **i.** notes on a musical scale ___

e. months beginning with *J* ___   **j.** cents in a dime ___

Number Scramble

Rearrange the numbers and words to build the largest possible number in expanded notation.

ten thousands   ones   3   1   8   thousands   5

tens   4   2   hundreds   tenths

Largest possible number: _____

_____

EVERYTHING IN PLACE

Rolling

1. *Roll four number cubes (each numbered 1–6) five times. For each roll, write on the chart the largest number and the smallest number that you can make by using the numbers on the cubes as digits. (Sometimes, the largest and the smallest number may be the same.)*
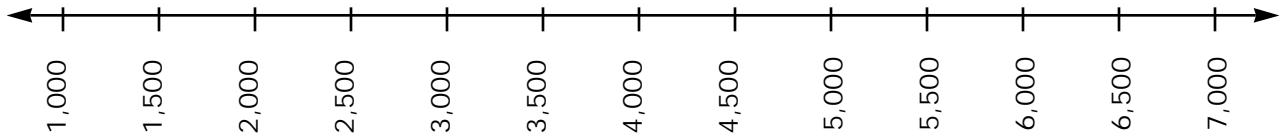
Roll	Smallest Number	Largest Number
1		
2		
3		
4		
5		

2. *Now write the largest number and the smallest number that you wrote on the chart above. Compare your two numbers with those of other students. Whose largest number is the largest? Whose smallest number is the smallest?*

Largest Number: _____ **Smallest Number:** _____

Ordering

3. *On the number line below, write all the numbers from the chart above.*

1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 5,500 6,000 6,500 7,000

TEACHER GUIDE

AfterMath™

BOOK E

Dear Teacher,

Welcome to *AfterMath*™. This program is designed to engage students in using a variety of math skills that will be important to them as developmental learners and as thinkers in the years ahead. Students will use critical-thinking, problem-solving, and computation skills as they complete the thirty-six lessons in the student book.

The activities in the *AfterMath* student book are based on seven strands, six of which are set forth in the standards developed by the National Council of Teachers of Mathematics. The strands are numeration, number theory, measurement, geometry, prealgebra, data interpretation, and logical reasoning. A list of activities and the skills covered appears on the next two pages. The activities are designed for students to work on their own, in pairs, or in small groups at their own pace.

The activities in the *AfterMath* student book may be applied in various ways. They may be used to supplement and reinforce classroom lessons. They may be used to extend or enrich daily lessons. Or, they may be used to provide challenges to students who enjoy experimenting with math.

The activities provide a variety of experiences for students, including writing, computing, experimenting, completing small projects, conducting research, and playing games. An icon marks challenging creative-thinking items. Students will become aware that mathematics is not reserved just for the classroom; it is a vital part of the world around them.

Try to preview all thirty-six activities in the student book before assigning particular activities. Students can complete the activities in any order that fits your needs. Note that some math experiments require the use of basic hands-on materials such as calculators, number cubes, playing cards, dominoes, and rulers (customary and metric).

AfterMath, Book E is designed specifically for students in fifth grade. However, the activities can be used with advanced mathematics students in fourth grade, as well as with students who require mathematics skills reinforcement in sixth grade.

Enjoy the activities. Encourage students to do as many as possible. Galileo once said that mathematics is the alphabet in which the universe was created. So, let's begin to learn that alphabet.

Author: Christopher Forest

Editor: Dale Lyle

Designer: Jamie Ruh

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Activity   **Page**

(continues)

N: Numeration	G: Geometry	LR: Logical Reasoning
NT: Number Theory	PA: Prealgebra	
M: Measurement	DI: Data Interpretation	

Answers

LET'S GO A FEW ROUNDS (SB page 2)

Rounding: (bold is largest rounded number in row)

			A	B	C
1.	189,217	—	189,000	190,000	**200,000**
2.	246,709	—	247,000	**250,000**	200,000
3.	314,289	—	**314,000**	310,000	300,000
4.	75,216	—	75,000	80,000	**100,000**
5.	905,213	—	**905,000**	910,000	900,000
6.	678,217	—	678,000	680,000	**700,000**
7.	8,124,214	—	**8,124,000**	8,120,000	8,100,000
8.	956,212	—	956,000	960,000	**1,000,000**
9.	600,956	—	**601,000**	600,000	600,000
10.	189,717	—	190,000	190,000	**200,000**

Taking a Closer Look:

1. See boldfaced numbers in *Rounding* list above.

2. Column A: 4 times
   Column B: 1 time
   Column C: 5 times

3. 200,000
   200,000
   300,000
   100,000
   200,000
   1,000,000 (956,212 rounded to the hundred-thousands place)

4. 680,000; Any number from 675,000 to 684,999 will round to 680,000.

SPEAKING OF NUMBERS (SB page 3)

1. Chaz: 18
2. Nan: 164
3. Lara: 1361.4
4. David: 0.945
5. Elizabeth: 5,232
6. Rien: 722,485
7. Kaleb: 95.372
8. Abraham: 87

SKILL BUILDERS 1 (SB page 4)

They Add Up:

a. 11 + 12 + 13 = 36
b. 6 + 8 + 10 + 12 = 36
c. 11 + 13 + 15 + 17 = 56
d. 15 + 16 + 17 + 18 = 66
e. 16 + 18 + 20 + 22 = 76

Number Match:

a.	9	d.	4	g.	1	j.	10
b.	2	e.	3	h.	7		
c.	5	f.	6	i.	8		

Number Scramble:

Largest possible number: 8 ten thousands, 7 thousands, 5 hundreds, 4 tens, 3 ones, 2 tenths

EVERYTHING IN PLACE (SB page 5)

1. Numbers will vary. Rolls of four 1s and four 6s will produce equal largest and smallest numbers.

2. Students' largest and smallest numbers will vary (smallest possible number: 1,111; largest possible: 6,666).

3. Number lines will vary.

NUMBER-SPEAK (SB page 6)

Order Up:
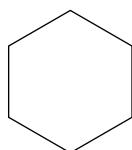
1. dozen: 12   week: 7   millimeter: 1,000
   trio: 3   pentagon: 5   decade: 10
   centipede: 100   unicorn: 1   octagon: 8

2. a. unicorn   f. decade
   b. trio   g. dozen
   c. pentagon   h. centipede
   d. week   i. millimeter
   e. octagon

Quad Time:

Words and definitions will vary. Sample words:

a. *quadruped:* "an animal that walks on four legs"
b. *quadrilateral:* "a figure with four sides and four angles"
c. *quadruple:* "multiply by four"

Here's a Hexagon: See illustration.

EVENS, ODDS, AND PLACES (SB page 7)

Card Magic:

1. Students should be able to do the trick.
2. Students' responses will vary.

You've Got My Number:

Card placement: 3, 4, 2, 6, 5, 1