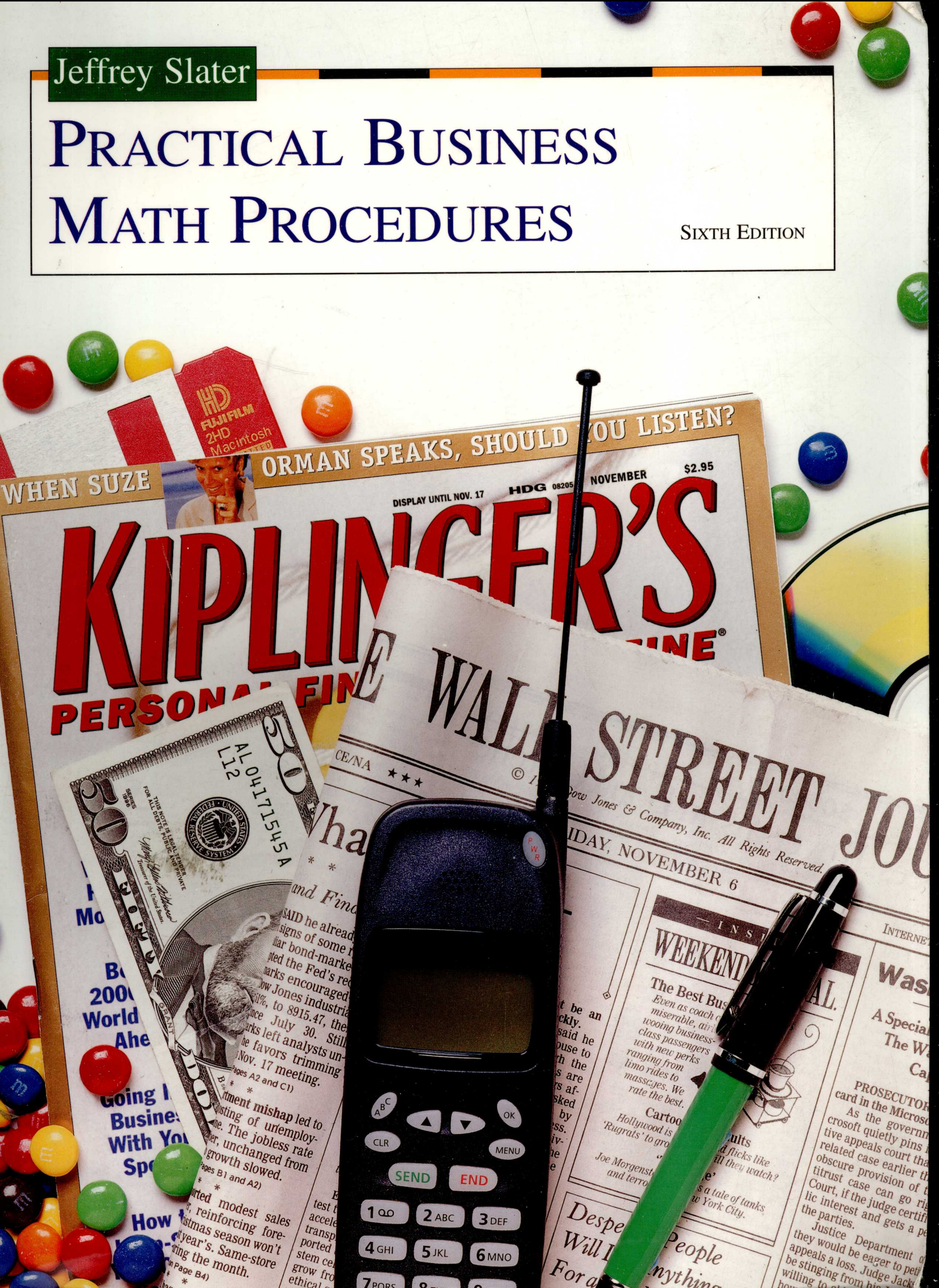
Jeffrey Slater

PRACTICAL BUSINESS MATH PROCEDURES

SIXTH EDITION



PRACTICAL BUSINESS MATH PROCEDURES

Jeffrey Slater
North Shore Community College
Danvers, Massachusetts

Sixth Edition

Irwin
McGraw-Hill

Boston Burr Ridge, IL Dubuque, IA Madison, WI
New York San Francisco St. Louis
Bangkok Bogotá Caracas Lisbon London Madrid Mexico City Milan
New Delhi Seoul Singapore Sydney Taipei Toronto

McGraw-Hill Higher Education
A Division of The ***McGraw-Hill*** *Companies*

Chapter opening main photos:
Chapter 1: ©PhotoDisc. Chapter 2: ©Michael Dwyer/Stock Boston. Chapter 3: ©PhotoDisc. Chapter 4: ©Andy Sacks/Tony Stone Images. Chapter 5: ©PhotoDisc. Chapter 6: ©PhotoDisc. Chapter 7: ©Superstock. Chapter 8: ©John Coletti/The Picture Cube. Chapter 9: ©PhotoDisc. Chapter 10: ©PhotoDisc. Chapter 11: ©PhotoDisc. Chapter 12: ©PhotoDisc. Chapter 13: ©Bruce Ayres/Tony Stone Images. Chapter 14: ©PhotoDisc. Chapter 15: ©Greg Vaughn/Tony Stone Images. Chapter 16: ©Black Sheep Stock Photography. Chapter 17: ©Peter Langone/Tony Stone Images. Chapter 18: ©PhotoDisc. Chapter 19: ©PhotoDisc. Chapter 20: ©Leverett Bradley/Tony Stone Images. Chapter 21: Courtesy American Stock Exchange/Photography by Alan M. Rosenberg. Chapter 22: ©PhotoDisc.

All additional chapter opening photos: ©PhotoDisc.

Wall Street Journal articles republished by permission of Dow Jones, Inc. via Copyright Clearance Center, Inc. All Rights Reserved Worldwide.

Kiplinger's articles reprinted by permission of *Kiplinger's Personal Finance Magazine.* Chapter 1: November 1998. Chapter 2: July 1998. Chapter 3: December 1998. Chapter 4: August 1998. Chapter 5: June 1998. Chapter 6: November 1998. Chapter 7: November 1998. Chapter 8: September 1998. Chapter 9: November 1998. Chapter 10: October 1998. Chapter 11: October 1998. Chapter 12: May 1998. Chapter 13: May 1998. Chapter 14: December 1998. Chapter 15: December 1998. Chapter 16: January 1999. Chapter 17: June 1998. Chapter 18: March 1998. Chapter 19: January 1998. Chapter 20: July 1998. Chapter 21: December 1998. Chapter 22: December 1998.

PRACTICAL BUSINESS MATH PROCEDURES

Copyright © 2000, 1997, 1994, 1991, 1987, 1983 by The McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

This book is printed on acid-free paper.

5 6 7 8 9 0 DOW/DOW 9 0 9 8 7 6 5 4 3 2 1

ISBN 0-07-366064-7 (student's edition)
ISBN 0-07-366065-5 (teacher's edition)
ISBN 0-07-229861-8 (brief student's edition)
ISBN 0-07-229862-6 (brief teacher's edition)

Vice president/Editor-in-chief: *Michael W. Junior*
Publisher: *Jeffrey J. Shelstad*
Executive editor: *Richard T. Hercher, Jr.*
Senior developmental editor: *Gail Korosa*
Freelance developmental editor: *Loretta Scholten*
Marketing manager: *Zina Craft*
Senior project manager: *Susan Trentacosti*
Senior production supervisor: *Lori Koetters*
Design team leader: *Michael Warrell*
Cover photo: *Sharon Hoogstraten*
Senior photo research coordinator: *Keri Johnson*
Photo researcher: *Corrine L. Johns*
Senior supplement coordinator: *Cathy L. Tepper*
Compositor: *GAC Indianapolis*
Typeface: *10/12 Times Roman*
Printer: *R. R. Donnelley & Sons Company*

Library of Congress Cataloging-in-Publication Data

Slater, Jeffrey (date)
Practical business math procedures / Jeffrey Slater. — 6th ed.
p. cm.
Includes bibliographical references and index.
ISBN 0-07-366064-7 (student). — ISBN 0-07-366065-5 (teacher's)
1. Business mathematics—Problems, exercises, etc. I. Title.
HF5694.S57 2000
650′.01′513—dc21 99-15438

http://www.mhhe.com

Dedicated to:

Shelley—my best pal

Abby and Mike

Russ and Claire

Maggie, Molly, Gracie, and Amber

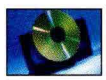
—Love, Jeff

NOTE TO STUDENTS

Preview of Special Features

Before looking at how to succeed in each chapter, let's look at some special features.

1. **The toll-free, 24-hour hotline.** This toll-free number for students allows you to call anytime and get extra help on any of the 22 summary practice tests located at the end of each chapter. As the author, I have recorded messages on how you should solve each problem. Think of this hotline as a pre-exam tune-up. The toll-free number is 1-800-338-9708.
2. **Group activity: A Kiplinger approach.** In each chapter you can debate a business math issue I raise based on a *Kiplinger's Personal Finance Magazine* article that is presented. This is great for critical thinking, as well as improving your writing skills.
3. ***The Wall Street Journal* newspaper.** This newspaper insert helps explain how to read *The Wall Street Journal,* as well as show how business math relates to it. The newspaper is page-referenced to the text and is helpful for those who have never followed stocks, bonds, and mutual funds.
4. ***Business Math Handbook and Study Guide.*** This reference guide contains all the tables found in the text. It makes homework, exams, etc. easier to deal with than flipping back and forth through the text. The *Handbook* also features a built-in study guide that provides self-paced worksheets that review each chapter's vocabulary, theory, and math applications. A set of 10 extra word problems for each chapter is included. Also included is a calculator reference guide with advice on how to use different calculators.
5. **Blueprint aid boxes.** For the first eight chapters (not in Chapter 4), blueprint aid boxes are available to help you map out a plan to solve a word problem.



6. **Videotapes.** There is a complete set of videotapes that review all the practice quizzes in the text.
7. **The Business Math Tutor.** This software is a tutorial that guides you through the entire text. It is highly visual and user friendly.

8. **Spreadsheet templates.** Excel® templates are available for selected end-of-chapter problems. You can run these templates as is or enter your own data. The templates also include an interest table feature that enables you to input any percentage rate and any terms. The program will then generate table values for you.
9. **Business Math Internet Resource Guide.** This Guide lists Web sites covering topics from each chapter, as well as descriptions of what you can expect to find at each site. It is referenced on the Scrapbook page in the text and includes group projects you can work on using the exciting possibilities of the Web.
10. **New CD-ROM.** The CD packaged with the text includes practice quizzes, tutorials, links to the Web sites listed in the Business Math Internet Resource Guide, and the Excel® templates mentioned above.
11. **The Slater Business Math Web site.** Visit the site at www.mhhe.com/slater and find the Internet Resource Guide with hot links, tutorials, practice quizzes, and other materials useful for the course.

How to Read and Use the Book

The colors in this text have a purpose. You should read the description below, then look at several pages to see how it works.

Blue: Movement, cancellations, steps to solve, arrows, blueprints

Gold: Formulas and steps

Green: Tables and forms

Red: Key items we are solving for

试读结束，需要全本PDF请购买 www.ertongbook.com

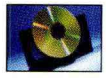
Chapters

Each chapter is broken down into learning units. Each learning unit covers a key concept or a small group of concepts. Be sure to look at the You and Your Money feature.

Learning Objectives

At the beginning of each chapter you'll find a list of learning objectives. Each is page referenced.

Practice Quizzes



At the end of each learning unit is a practice quiz, followed by solutions. These provide you with immediate feedback on your understanding of the unit. These are all solved on videotapes. Check with your instructor for availability.

Chapter Organizer

At the end of each chapter is a quick reference guide called the Chapter Organizer. Key points, formulas, and examples are provided. A list of vocabulary terms is also included. All have page references. (A complete glossary is found at the end of the text.) Think of the chapter organizer as your set of notes.

Critical Thinking Discussion Questions

Factual, as well as thought-provoking, questions appear after the chapter organizer.

Problems

At the end of each chapter is a complete set of drill and word problems. Check figures for the odd-numbered problems are located in Appendix B.

Challenge Problems

The last two word problems in each chapter let you "stretch" your business math skills. These are harder and require more effort.

Additional Homework Assignments by Learning Unit

At the end of the text in Appendix A is a complete set of drill and word problems arranged by learning unit. These can be used for additional reinforcement. Your instructor may ask you to turn these in. Check figures for the odd-numbered problems are shown in Appendix B. On the inside back cover of the book is a table showing page references for each assignment.

Summary Practice Test

This is a test before the test. All questions are page referenced back to the topic so you can check your methods. The test is a combination of drill and word problems. Check figures for *all* practice tests are in Appendix B. Remember: There is a toll-free hotline to review these tests at 1-800-338-9708.

Business Math Scrapbook

At the end of each chapter you will find actual clippings from *The Wall Street Journal* and various other publications. These articles will give you a chance to use the theory provided in the chapter to apply to the real world. It allows you to put your math skills to work.

Cumulative Reviews

At the end of Chapters 3, 8, and 13 are word problems that test your retention of business math concepts and procedures. Check figures for *all* cumulative review problems are in Appendix B.

Jeffrey Slater

ACKNOWLEDGMENTS

Academic Experts

Alec Beaudoin
Bridget Bell
Maureen H. Bessette
Evelyn Bookout
Donald F. Boyer
Nelson Collins
Ron Cooley
Charles Darth
Helen Davis
Patricia Dennis
Acie Earl
DiAnna Eason
Steve Feins
Alex George
Jordan Greer
Cheryl Honore
Sharon Johnson
Tracey L. Johnson
Gwendolyn Jones
Arlene Luhman
Douglas Mace
Patricia Madison Manninen
Leland Mansuetti
Kathy Marino
Joyce Mathews
Jean McArthur
Debbie McConkey
Marilyn McGahon
Jeff Morford
Kathy C. Nickell
Evelyn L. Plummer
Lou Procoprio
Glen Rabb
Helen Seery
Jim Setterstrom
Betty Taylor
Jann Underwood
Vicki Vorrell
Jeffrey Waybright
Keith Weidkamp
Nancy Weller
Ron Weston
Steve Wong
Daniel Wrentmore
Larry Zigler

Company/Application(s)

McDonald's Corp.—*Business decision making; fractions, taxes, statistics*

Tootsie Roll Industries, Inc.—*Dissecting and solving a word problem*

Christies International PLC.—*Division shortcuts*

Kiplinger's Personal Finance Magazine—Group projects at end of each chapter

Airbus Industrie—*Division shortcut*

M&M Mars Co.—*Fractions; decimals; percents; conversions*

Reebok International Ltd.—*Adding and subtracting fractions*

Procter & Gamble Co.—*Multiplying and dividing fractions*

Time Warner Inc.—*Fractions*

Home Depot Inc.—*Fractions*

ECA Windam, New York—*Decimals*

New York Stock Exchange—*Decimals; stocks*

Dow Jones & Company, Inc.—*Scrapbooks; foreign currency*

MasterCard—*Banking; debit cards; installments*

Visa—*Banking; installments*

Hawaiian Airlines—*ATMs*

U.S. Treasury—*Internet; Treasury bills*

Blockbuster Video—*ATMs*

Citicorp—*Banking*

Nike—*Solving for the unknown*

Adidas—*Solving for the unknown*

Walt Disney Co.—*Equations; statistics*

Hershey Foods Corp.—*Equations*

Coca-Cola Co.—*Percents; financial reports*

PepsiCo, Inc.—*Percents; financial reports*

JCPenney Co.—*Percents; financial reports*

Circuit City Stores, Inc.—*Percent increase and decrease*

Nissan Motor Corp. USA—*Percent increase and decrease*

Kellogg Corp.—*Solving for portion*

Compaq Computer Corp.—*Solving for portion*

Air India—*Discounts*

Toys "Я" Us—*Discounts*

IBM—*Freight charges*

Avon Products, Inc.—*Discounts*

Nucor Corp.—*Discounts*

Cotter & Company (True Value)—*Retail*

Campbell Soup Co.—*Markdowns*

Wal-Mart Stores Inc.—*Markdowns*

Kmart—*Markdowns*

Victoria's Secret—*Retail*

United Airlines—*Payroll*

Northwest Airlines—*Payroll*

Grand Union Co.—*Notes*

Fidelity—*Annuities*

American Express Co.—*Cost of credit cards*

Bestfoods—*Income statement*

Fuji Photo Film Co.—*Income statement*

General Motors Corp. Thailand—*Inventory*

Prudential Insurance Co.—*Insurance; E-trade; online trading*

Charles Schwab & Co.—*Online trading*

QVC—*Median*

Philadelphia Suburban Bank Corp.—*Frequency distributions*

Logan International Airport—*Graphs*

Burger King—*Statistics*

Pizza Hut—*Statistics*

Taco Bell—*Statistics*

Wendy's International, Inc.—*Statistics*

KFC—*Statistics*

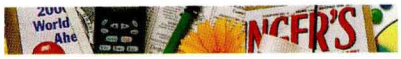
Hardee's—*Statistics*

Subway—*Statistics*

Dairy Queen—*Statistics*

Domino's—*Statistics*

Gap—*Statistics*



CONTENTS

Kiplinger's Personal Finance Magazine Subscription Form 1

Chapter 1 WHOLE NUMBERS: HOW TO DISSECT AND SOLVE WORD PROBLEMS 3

LU 1.1 Reading, Writing, and Rounding Whole Numbers 5
LU 1.2 Adding and Subtracting Whole Numbers 9
LU 1.3 Multiplying and Dividing Whole Numbers 13

Chapter 2 FRACTIONS 33

LU 2.1 Types of Fractions and Conversion Procedures 34
LU 2.2 Adding and Subtracting Fractions 38
LU 2.3 Multiplying and Dividing Fractions 45

Chapter 3 DECIMALS 63

LU 3.1 Rounding; Fraction and Decimal Conversions 64
LU 3.2 Adding, Subtracting, Multiplying, and Dividing Decimals 70

Cumulative Review: A Word Problem Approach—Chapters 1–3 85

Chapter 4 BANKING 87

LU 4.1 The Checking Account; Credit Card Transactions 88
LU 4.2 Bank Statement and Reconciliation Process; Trends in Banking 94

Chapter 5 SOLVING FOR THE UNKNOWN: A HOW-TO APPROACH FOR SOLVING EQUATIONS 113

LU 5.1 Solving Equations for the Unknown 115
LU 5.2 Solving Word Problems for the Unknown 119

Chapter 6 PERCENTS AND THEIR APPLICATIONS 135

LU 6.1 Conversions 136
LU 6.2 Application of Percents—Portion Formula 140

Chapter 7 DISCOUNTS: TRADE AND CASH 165

LU 7.1 Trade Discounts—Single and Chain 166
LU 7.2 Cash Discounts, Credit Terms, and Partial Payments 172

Chapter 8 MARKUPS AND MARKDOWNS; INSIGHT INTO PERISHABLES 195

LU 8.1 Markups Based on Cost (100%) 197
LU 8.2 Markups Based on Selling Price (100%) 201
LU 8.3 Markdowns and Perishables 207

Cumulative Review: A Word Problem Approach—Chapters 6–8 222

Chapter 9 PAYROLL 225

LU 9.1 Calculating Various Types of Employees' Gross Pay 226
LU 9.2 Computing Payroll Deductions for Employees' Pay; Employers' Responsibilities 230

Chapter 10 SIMPLE INTEREST 249

LU 10.1 Calculation of Simple Interest and Maturity Value 250
LU 10.2 Finding Unknown in Simple Interest Formula 253
LU 10.3 U.S. Rule—Making Partial Note Payments before Due Date 255

Chapter 11 PROMISSORY NOTES, SIMPLE DISCOUNT NOTES, AND THE DISCOUNT PROCESS 269

LU 11.1 Structure of Promissory Notes; the Simple Discount Note 270
LU 11.2 Discounting an Interest-Bearing Note before Maturity 273

Chapter 12 COMPOUND INTEREST AND PRESENT VALUE 285

LU 12.1 Compound Interest (Future Value)—The Big Picture 286
LU 12.2 Present Value—The Big Picture 292

Chapter 13 ANNUITIES AND SINKING FUNDS 305

LU 13.1 Annuities: Ordinary Annuity and Annuity Due (Find Future Value) 306
LU 13.2 Present Value of an Ordinary Annuity (Find Present Value) 311
LU 13.3 Sinking Funds (Find Periodic Payments) 314

Cumulative Review: A Word Problem Approach—Chapters 10–13 324

Chapter 14 INSTALLMENT BUYING, RULE OF 78, AND REVOLVING CHARGE CREDIT CARDS 327

LU 14.1 Cost of Installment Buying 328
LU 14.2 Paying Off Installment Loan before Due Date 332
LU 14.3 Revolving Charge Credit Cards 335

Chapter 15 THE COST OF HOME OWNERSHIP 351

LU 15.1 Types of Mortgages and the Monthly Mortgage Payment 352
LU 15.2 Amortization Schedule—Breaking Down the Monthly Payment 354

Chapter 16 HOW TO READ, ANALYZE, AND INTERPRET FINANCIAL REPORTS 367

LU 16.1 Balance Sheet—Report as of a Particular Date 368
LU 16.2 Income Statement—Report for a Specific Period of Time 373
LU 16.3 Trend and Ratio Analysis 376

Chapter 17 DEPRECIATION 395

LU 17.1 Concept of Depreciation and the Straight-Line Method 396
LU 17.2 Units-of-Production Method 398
LU 17.3 Sum-of-the-Years'-Digits Method 399
LU 17.4 Declining-Balance Method 401
LU 17.5 Modified Accelerated Cost Recovery System (MACRS) with Introduction to ACRS 402

Chapter 18 INVENTORY AND OVERHEAD 415

LU 18.1 Assigning Costs to Ending Inventory—Specific Identification; Weighted Average; FIFO; LIFO 417
LU 18.2 Retail Method; Gross Profit Method; Inventory Turnover; Distribution of Overhead 421

Chapter 19 SALES, EXCISE, AND PROPERTY TAX 437

LU 19.1 Sales and Excise Taxes 438
LU 19.2 Property Tax 440

Chapter 20 LIFE, FIRE, AND AUTO INSURANCE 451

LU 20.1 Life Insurance 452
LU 20.2 Fire Insurance 456
LU 20.3 Auto Insurance 459

Chapter 21 STOCKS, BONDS, AND MUTUAL FUNDS 475

LU 21.1 Stocks 476
LU 21.2 Bonds 480
LU 21.3 Mutual Funds 482

Chapter 22 BUSINESS STATISTICS 495

LU 22.1 Mean, Median, and Mode 496
LU 22.2 Frequency Distributions and Graphs 499
LU 22.3 Measures of Dispersion (optional) 503

Appendix A ADDITIONAL HOMEWORK ASSIGNMENTS BY LEARNING UNIT A

Appendix B CHECK FIGURES B

Appendix C GLOSSARY C

Appendix D METRIC SYSTEM D

INDEX IN

BECAUSE MONEY MATTERS . . . SUBSCRIBE TO *KIPLINGER'S* AT SPECIAL STUDENT RATES!

Every month, more than three million Americans turn to *Kiplinger's Personal Finance Magazine* for advice and information about how to manage their money. How to save it. Spend it. Invest it. Protect it. Insure it. And make more of it.

If it affects you and your money, then you'll find it in the pages of *Kiplinger's.* From our annual ranking of the nation's best mutual funds to our yearly rating of new automobiles we provide you with a different kind of investment publication.

We make it easy for you to subscribe with the lowest rates available to students and educators. Just provide your name and address below. Make checks payable to *Kiplinger's Personal Finance Magazine.* Or, if you prefer we will bill you later.

_____

Student's Name

_____ _____

Address Apt. #

_____ _____ _____

City State Zip

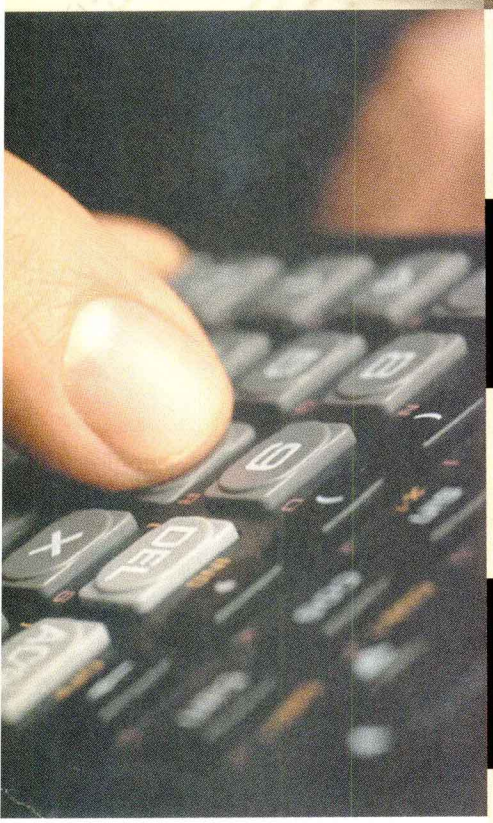
(____)_____

Phone

Term: One year for $12.97

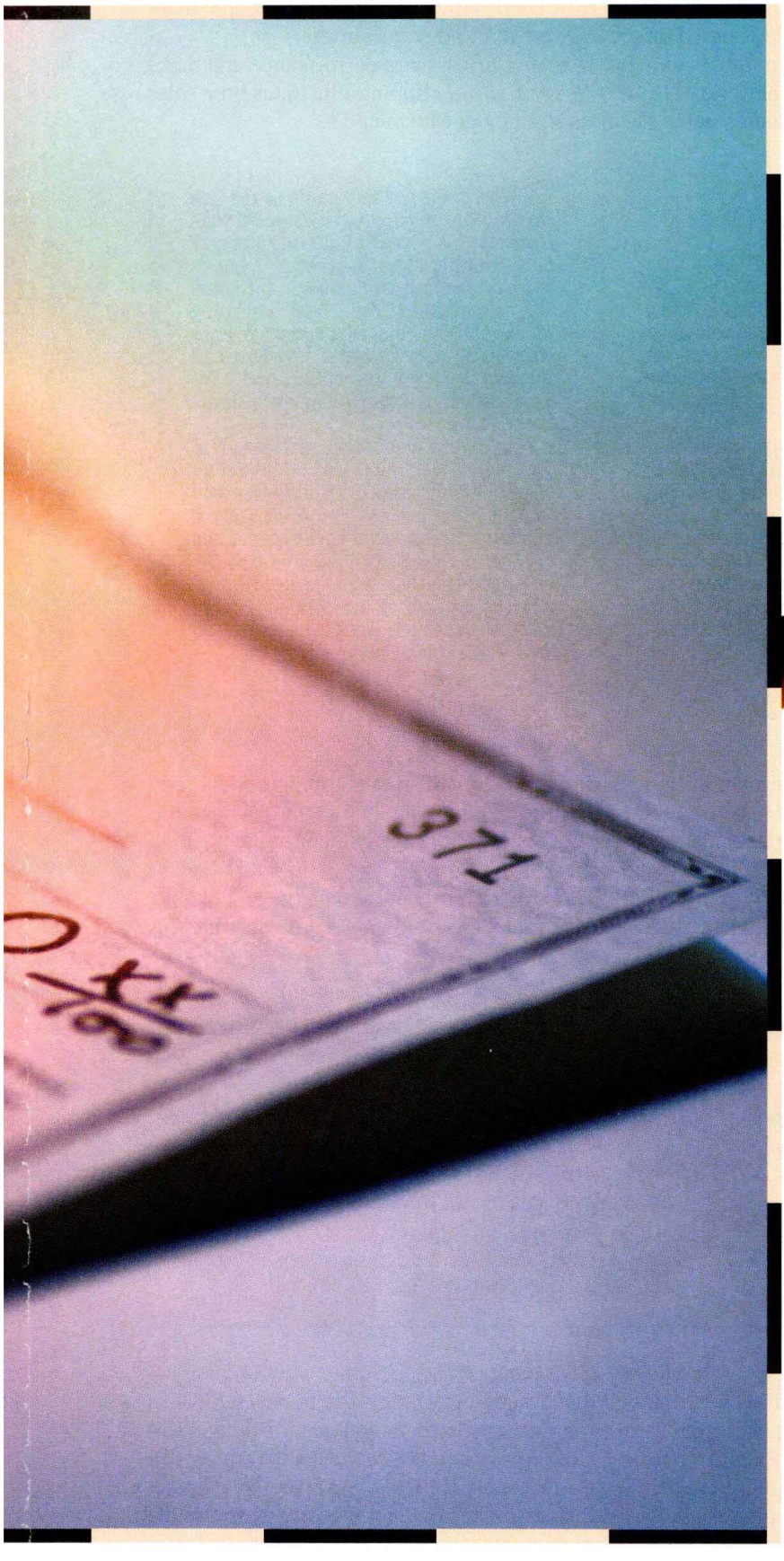
After completing the form, please mail it to: *Kiplinger's Personal Finance Magazine,* P.O. Box 3291, Harlan, Iowa 51593-2471.

试读结束，需要全本PDF请购买 www.ertongbook.com



You and Your Money

Do you order your checks from your bank and pay more than $12 for 200 plain checks printed with your name and address? A printer can fill your order for less than $5. How do you order checks from a printer? Watch for check-printing advertisements in the Sunday newspaper coupon sections.



1 Whole Numbers; How to Dissect and Solve Word Problems

Learning Unit Objectives

LU 1.1 Reading, Writing, and Rounding Whole Numbers

- Use place values to read and write numeric and verbal whole numbers *(p. 5)*.
- Round whole numbers to the indicated position *(pp. 6–7)*.
- Use blueprint aid for dissecting and solving a word problem *(pp. 7–8)*.

LU 1.2 Adding and Subtracting Whole Numbers

- Add whole numbers; check and estimate addition computations *(pp. 9–10)*.
- Subtract whole numbers; check and estimate subtraction computations *(pp. 11–12)*.

LU 1.3 Multiplying and Dividing Whole Numbers

- Multiply whole numbers; check and estimate multiplication computations *(pp. 13–15)*.
- Divide whole numbers; check and estimate division computations *(pp. 15–17)*.

Business decision making usually involves numbers. These numbers frequently answer questions such as: How much? How many? How soon? How far? How low? People of all ages make business decisions based on the answers to number questions.

Companies often use numbers to measure their market-share performance and make future policy decisions. The following *Wall Street Journal* clipping illustrates how sales numbers influenced the change in the business strategy of McDonald's.

McDonald's Franchisees Told About Menu Plans

By a WALL STREET JOURNAL *Staff Reporter*

ORLANDO, Fla. – **McDonald's Corp.,** acknowledging that its menu needs perking up, plans to improve the taste of several sandwiches and test what it calls "an indulgent bacon cheeseburger" soon.

The fast-food giant also disclosed that it is working on a crispy chicken nuggets item intended to appeal more to adults, and that it will roll out a line of candied ice creams called McFlurry desserts. And, reversing a decision made under pressure from advocates of healthier fare several years ago, McDonald's plans to boost the fat content of its milkshakes.

News of the changes came as the Oak Brook, Ill., company gave its world-wide franchisees a pep talk, following a year of disappointing sales, marketing miscues and domestic management turnover. The franchisees, who are attending McDonald's biennial convention, seemed cheered by word of menu revisions and the way food will be cooked, and gave U.S. Chairman Jack Greenberg a standing ovation.

The likely menu changes appear in part to be a tacit admission of the failure of the highly touted "adult-oriented" Deluxe line, led by the Arch Deluxe hamburger introduced at the convention two years ago. Since then, the fish Deluxe sandwich has been replaced by an updated version of the popular Filet-o-Fish sandwich, and work is under way on the Deluxe chicken sandwich.

© 1998 Dow Jones & Company, Inc.

In addition to the information in this article, McDonald's plans to upgrade its food preparation. This includes installing "flash-toasting" equipment, a new sandwich assembly process, and computerized gear that transmits orders from the counter to the cooking area. The food will be tastier, fresher, and hotter.

Companies often follow a general problem-solving procedure to arrive at a change in company policy. Using McDonald's as an example, the following steps illustrate this procedure:

Step 1.	State the problem(s).	Disappointing sales due to marketing mistakes and management turnover.
Step 2.	Decide on the best method(s) to solve the problem(s).	Menu revisions; improve relationships with franchisees; tastier, fresher, and hotter food through a new computerized system.
Step 3.	Does the solution make sense?	Acknowledges recent trends to tastier adult foods that are fresher and hotter.
Step 4.	Evaluate results.	As market share to adults increases, company earnings will increase.

As you can see, numbers—for McDonald's, a year of disappointing sales numbers—are the foundation of business decision making. Your study of numbers begins with a review of basic computation skills that focuses on speed and accuracy. You may think, "But I can use my calculator." Even if your instructor allows you to use a calculator, you still must know the basic computation skills. You need these skills to know what to calculate, how to interpret your calculations, how to make estimates to recognize errors you made in using your calculator, and how to make calculations when you do not have a calculator. (How to use a calculator is explained in *Business Math Handbook.*)

The United States uses the *decimal numbering system,* or *base-10 system.* Your calculator gives the 10 single-digit numbers of the decimal system—0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The center of the decimal system is the decimal point. *Whole numbers* are to the left of the decimal point; *decimal numbers* (discussed in Chapter 3) are to the right of the

decimal point. This chapter discusses reading, writing, and rounding whole numbers; adding and subtracting whole numbers; and multiplying and dividing whole numbers.

LEARNING UNIT 1.1 Reading, Writing, and Rounding Whole Numbers

World's Busiest Airports

RANK	CITY (AIRPORT)	1996 TOTAL PASSENGERS
1	Chicago (O'Hare Int'l)	69,133,189
2	Atlanta (Hartsfield Atlanta Int'l)	63,344,730
3	Dallas/Ft. Worth Airport, (Dallas/Fort Worth Int'l)	58,034,503
4	Los Angeles (Los Angeles Int'l))	57,974,559

© 1998 Dow Jones & Company, Inc. Source: Airports Council International.

We often use whole numbers in business calculations. For example, look at *The Wall Street Journal* clipping "World's Busiest Airports." As you might expect, the world's busiest airport is O'Hare International Airport in Chicago. In 1996, O'Hare had a total of 69,133,189 passengers. This number—read as sixty-nine million, one hundred thirty-three thousand, one hundred eighty-nine—is a *whole number.* Now let's begin our study of whole numbers.

Reading and Writing Numeric and Verbal Whole Numbers

The decimal number system is a *place-value system.* We can write any whole-number amount with the 10 digits of the decimal system because the position, or placement, of the digits in a number gives the value of the digits.

To determine the value of each digit in a number, we use a place-value chart (Figure 1.1) that divides numbers into named groups of three digits, with each group separated by a comma. To separate a number into groups, you begin with the last digit in the number and insert commas every three digits, moving from right to left. This divides the number into the named groups (units, thousands, millions, billions, trillions) shown in the place-value chart. Within each group, you have a ones, tens, and hundreds place.

In Figure 1.1, the numeric number 1,605,743,891,412 illustrates place values. When you study the place-value chart, you can see that the value of each place in the chart is 10 times the value of the place to the right. We can illustrate this by analyzing the last four digits in the number 1,605,743,891,412:

$$1{,}412 = (1 \times 1{,}000) + (4 \times 100) + (1 \times 10) + (2 \times 1)$$

So we can also say that in the number 745, the "7" means seven hundred (700); in the number 75, the "7" means 7 tens (70).

To read and write a numeric number in verbal form, you begin at the left and read each group of three digits as if it were alone, adding the group name at the end (except the last units group and groups of all zeros). Using the place-value chart in Figure 1.1, the number 1,605,743,891,412 is read as one trillion, six hundred five billion, seven hundred forty-three million, eight hundred ninety-one thousand, four hundred twelve. You do not read zeros. They fill vacant spaces as placeholders so that you can correctly state the number values. Also, the numbers twenty-one to ninety-nine must have a hyphen. And most important, when you read or write whole numbers in verbal form, do not use the word *and.* In the decimal system, *and* indicates the decimal, which we discuss in Chapter 3.

By reversing the above process of changing a numeric number to a verbal number, you can use the place-value chart to change a verbal number to a numeric number. Remember that you must keep track of the place value of each digit. The place values of the digits in a number determine its total value.

FIGURE 1.1
Whole-number place-value chart

Trillions				Billions				Millions				Thousands				Units		
Hundred trillions	Ten trillions	Trillions	Comma	Hundred billions	Ten billions	Billions	Comma	Hundred millions	Ten millions	Millions	Comma	Hundred thousands	Ten thousands	Thousands	Comma	Hundreds	Tens	Ones
		1	,	6	0	5	,	7	4	3	,	8	9	1	,	4	1	2

Rounding Whole Numbers

Many of the whole numbers you read and hear are rounded numbers. Government statistics are usually rounded numbers. The financial reports of companies also use rounded numbers. All rounded numbers are *approximate* numbers. The more rounding you do, the more you approximate the number.

Rounded whole numbers are used for many reasons. With rounded whole numbers you can quickly estimate arithmetic results, check actual computations, report numbers that change quickly such as population numbers, and make numbers easier to read and remember.

Numbers can be rounded to any identified digit place value, including the first digit of a number (rounding all the way). To round whole numbers, use the following three steps:

Rounding Whole Numbers

Step 1. Identify the place value of the digit you want to round.
Step 2. If the digit to the right of the identified digit in Step 1 is 5 or more, increase the identified digit by 1 (round up). If the digit to the right is less than 5, do not change the identified digit.
Step 3. Change all digits to the right of the rounded identified digit to zeros.

EXAMPLE 1 Round 9,362 to the nearest hundred.

Step 1. 9,362 The digit 3 is in the hundreds place value.

Step 2. The digit to the right of 3 is 5 or more (6). Thus, 3, the identified digit in Step 1, is now rounded to 4. You change the identified digit only if the digit to the right is 5 or more.

9,462

Step 3. 9,400 Change digits 6 and 2 to zeros, since these digits are to the right of 4, the rounded number.

By rounding 9,362 to the nearest hundred, you can see that 9,362 is closer to 9,400 than to 9,300.

EXAMPLE 2 Round 67,951 to the nearest thousand.

Step 1. 67,951 The digit 7 is in the thousands place value.

Step 2. Digit to the right of 7 is 5 or more (9). Thus, 7, the identified digit in Step 1, is now rounded to 8.

68,951

Step 3. 68,000 Change digits 9, 5, and 1 to zeros, since these digits are to the right of 8, the rounded number.

By rounding 67,951 to the nearest thousand, you can see that 67,951 is closer to 68,000 than to 67,000.

Annual Housing Costs in Selected Cities

Bombay, India	$70,459
Duesseldorf, Germany	28,868
Hong Kong, China	132,892
London, England	58,770
Madrid, Spain	31,916
New York, NY	61,449

© 1998 Dow Jones. Source: Runzheimer International.

We can use *The Wall Street Journal* clipping "Annual Housing Costs in Selected Cities" to illustrate rounding to the nearest thousand. Note that the annual cost of housing in New York is $61,449 and in Hong Kong, $132,892. Now round these numbers to the nearest thousand as shown above, and you can say, "The annual cost of New York housing is $61,000, but in Hong Kong, the annual cost of housing is $133,000." As you can see, numbers rounded to the nearest thousand can either be substantially less than the actual number, as in the New York annual housing cost, or a little more than the actual number, as in the Hong Kong annual housing cost.

Now let's look at **rounding all the way.** To round a number all the way, you round to the first digit of the number (the leftmost digit) and have only one nonzero digit remaining in the number.

EXAMPLE 3 Round 7,843 all the way.

Step 1. 7,843 Identified leftmost digit is 7.

Step 2. Digit to the right of 7 is greater than 5, so 7 becomes 8.

8,843

Step 3. 8,000 Change all other digits to zeros.

Rounding 7,843 all the way gives 8,000.

Remember that rounding a digit to a specific place value depends on the degree of accuracy you want in your estimate. For example, 24,800 rounds all the way to 20,000 because the digit to the right of 2 is less than 5. This 20,000 is 4,800 less than the original 24,800. You would be more accurate if you rounded 24,800 to the place value of the identified digit 4, which is 25,000.

Before concluding this unit, let's look at how to dissect and solve a word problem.

How to Dissect and Solve a Word Problem

As a student, your author found solving word problems difficult. Not knowing where to begin after reading the word problem caused the difficulty. Today, students still struggle with word problems as they try to decide where to begin.

Solving word problems involves *organization* and *persistence.* Recall how persistent you were when you learned to ride a two-wheel bike. Do you remember the feeling of success you experienced when you rode the bike without help? Apply this persistence to word problems. Do not be discouraged. Each person learns at a different speed. Your goal must be to FINISH THE RACE and experience the success of solving word problems with ease.

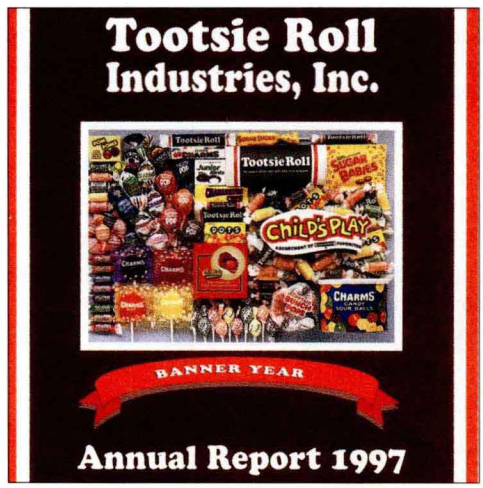
To be organized in solving word problems, you need a plan of action that tells you where to begin—a blueprint aid. Like a builder, you will refer to this blueprint aid constantly until you know the procedure. The blueprint aid for dissecting and solving a word problem looks like this:

Blueprint Aid for Dissecting and Solving a Word Problem

The facts	Solving for?	Steps to take	Key points

Now let's study this blueprint aid. The first two columns require that you *read* the word problem slowly. Think of the third column as the basic information you must know or calculate before solving the word problem. Often this column contains formulas that provide the foundation for the step-by-step problem solution. The last column reinforces the key points you should remember.

It's time now to try your skill at using the blueprint aid for dissecting and solving a word problem.



Courtesy Tootsie Roll Industries, Inc.

The Word Problem On the 100th anniversary of Tootsie Roll Industries, the company reported sharply increased sales and profits. Sales reached one hundred ninety-four million dollars and a record profit of twenty-two million, five hundred fifty-six thousand dollars. The company president requested that you round the sales and profit figures all the way.

试读结束，需要全本PDF请购买 www.ertongbook.com