

FOURTH EDITION

# *Computers!*

**Trainor ■ Krasnewich**



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San Francisco, CA 94133



## Computers! Fourth Edition

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# Preface to the Instructor



As we prepared to write the fourth edition of *Computers!*, we were again reminded of the speed at which technological change takes place. This technological revolution has quickened the pace of life for everyone. The core knowledge demanded of the productive worker and the informed citizen has increased dramatically. Regardless of past experiences or future career choices, today's (and tomorrow's) members of society must be technologically literate, as well as computer literate.

The difficulty comes in conveying to students *why* certain knowledge is essential, *what* is important, and *how* this information can be applied. The wealth of information available can be overwhelming. *Computers!* has proved that this information is relevant and easy to understand by students young and old who have little technological experience. To these people, your students, we hope to provide an up-to-date guide to information technology.

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## NEW TO THIS EDITION

Connectivity and increased integration of personal computers into the workplace continue to be underlying themes in *Computers!*. We have been closely watching these and other technological trends that are changing what a computer literate person needs to know. Incorporating coverage of these trends, as well as integrating suggestions from educators who have taught from earlier editions, has resulted in some important changes to the fourth edition:

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### Early Presentation of Personal Computer Concepts

We know most students are eager to start the hands-on part of a computer class. Therefore, software and hardware concepts necessary for operating personal computers are discussed in the first three chapters. Terms associated with graphical user interfaces, like click and drag, have been added. As with earlier editions, the fourth edition is designed to provide educators and their students with maximum flexibility in the coverage of computer concepts. Once Unit One is completed, students will be ready to read any chapter in Unit Two (Personal Productivity Tools) or Unit Three (Hardware and Data Communications).

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### Splitting Peripherals into Storage and I/O Components

Several topics are reorganized in the fourth edition to better meet user expectations and to make the topics as practical as possible. In response to wider utilization of CD technology and the explosion of multimedia applications, the chapter on peripheral hardware has been split in two: Input and output equipment, such as color monitors and laser printers, are covered in Chapter 9, and Chapter 10 now focuses on magnetic and optical storage hardware. By dividing this information into two chapters, the number of new terms and concepts students cover at one time is more manageable.

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### Putting Historical Developments into Perspective

Expanded coverage of hardware innovations challenged us to re-examine how we introduce technological concepts. In doing so we realized that technological breakthroughs might be better understood from an applications rather than an historical point of view. As a result, people and concepts that once appeared together in the Technological Progress chapter have become special “Who’s Who” features. Microsoft’s founder Bill Gates, for example, is featured in Chapter 3 on Software Concepts. Herman Hollerith of punched-card fame is discussed in Chapter 10 on Storage Hardware.

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### Graphics Evolves into Multimedia

New user interfaces, virtual realities, applications for voice and sound, and the wider acceptance of Macintosh microcomputers and Microsoft’s Windows have placed a new generation of tools into our computerized toolboxes. Along with coverage of these new tools, more emphasis is placed on the uses, limits, and operation of the technology currently available to your students. These changes are clearly evident in the reorganization of information on graphics into a new Graphics and Multimedia chapter.

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### New Appendix on Purchasing a Personal Computer

A new appendix that walks students through the process of purchasing a personal computer has been added by popular demand. We are often asked by our students which personal computer system we would recommend. Appendix E helps students answer this question by identifying personal applications and providing a closer look at the trade-offs and decisions people must make when buying a personal computer system.

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### Personal Productivity

The fourth edition is also updated with the latest innovations in personal productivity. Personal digital assistants and pen-based computers are discussed from a user's perspective in Chapter 8 on Processing Hardware. The impact of networks, personal computers, and interactive services is discussed in Chapter 11 on Networks and Data Communications. Other chapters have expanded coverage of multiprocessing computers along with fourth and fifth generation computer languages. Chapter 15 on Privacy, Ethics, Crime, and Security asks students to examine the rights of others when making decisions that concern ethical standards and privacy issues.

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### KEY FEATURES

Educators who have used earlier editions of *Computers!* have stated that its enduring strengths lie in its readability, comprehensive coverage, and modular design. We have tried to build on these strengths in the following ways:

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#### Flexible Design

This textbook contains much more than just explanations of current computer concepts. You can deliver this information to your students by using different chapter combinations and a variety of teaching tools. A hands-on introduction to DOS, Windows, Macintosh System 6 or System 7, and BASIC programming are available in the appendices. A practical guide to purchasing a personal computer system is found in Appendix E. Furthermore, over three dozen tutorial lab manuals for popular application packages and user interfaces can be integrated with the concepts covered in *Computers!*.

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#### Pedagogy

As in previous editions, *Computers!* emphasizes the integration of terms and concepts with the students' need to apply this information to their present and future work. Each chapter contains the following pedagogical features to support this goal.

- **Key Ideas**—topical outline of the chapter.
- **From the User's Point of View**—aids students' continuous search for relevance in what they are asked to learn.
- **Chapter Facts**—succinct presentation of the most important information in each chapter.
- **Terms to Remember**—listing of key words and phrases.

- **Mix and Match (new)**—asks students to match key terms to their definitions.
- **Review Questions**—objective questions about the key points in the chapter, easily answerable from the text.
- **Applying What You've Learned**—questions and projects requiring creative thought and independent research by the student.

Additional assignments, accompanying worksheets, and crossword puzzles using Terms to Remember are provided in the accompanying Student Study Guide. Together, these materials will help to motivate and reinforce student learning.

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### Real World Applications and Examples


The fourth edition includes many scenarios using technology in real situations. This alerts students to how all-encompassing technology really is. In addition, three features of special interest appear in each chapter:

- **"In the News"**—clips from the media that highlight topics of practical or special interest to students.
- **"Who's Who"**—a brief look at the people responsible for the technological innovations that change our lives:

Chapter 1	Pascal; Jobs and Wozniak
Chapter 2	Mauchly and Eckert
Chapter 3	Gates
Chapter 4	Bastian and Ashton
Chapter 5	Bricklin and Frankston
Chapter 6	McLuhan
Chapter 7	Codd
Chapter 8	Bardeen, Brattain, and Shockley; Hoff, Hyatt, Kilby, and Noyce
Chapter 9	Jacquard
Chapter 10	Hollerith
Chapter 11	Lovelace and Boole
Chapter 12	Watson, Sr.
Chapter 13	Babbage
Chapter 14	Kemeny and Kurtz
Chapter 15	Papert
Chapter 16	Bednorz and Muller; Turing

- **"A Closer Look"**—an in-depth and graphical investigation of a topic presented in each chapter:

Chapter 1	Personal Computing
Chapter 2	Buying a Computer System
Chapter 3	Comparing Popular Operating Environments
Chapter 4	Selecting a Word Processing Package
Chapter 5	Designing a Better Worksheet
Chapter 6	Presentation Software
Chapter 7	Hypermedia
Chapter 8	The Making of a Microprocessor

- 
- Chapter 9 Peripherals for Special Applications
  - Chapter 10 Building a Personal Computer
  - Chapter 11 Information Utilities
  - Chapter 12 Developing an Expert System
  - Chapter 13 Project Management Software
  - Chapter 14 Programming Languages (No Matter How You Say It)
  - Chapter 15 Privacy ... Is It Still Possible?
  - Chapter 16 Emerging Technologies

The result, *Computers!*, is a comprehensive, flexible, multimedia package designed to help you introduce computer concepts and promote computer awareness to students with various backgrounds and needs.

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### **SUPPLEMENTARY MATERIALS**

The following supplementary materials were developed to help customize *Computers!* to your unique teaching style and course objectives:

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#### **Complete Instructor's Manual**

The Instructor's Manual for this edition contains detailed support material for each chapter:

- lecture outline
- transparency masters keyed to the lecture outline
- additional material for lectures not found in the text
- teaching tips
- complete answers to the Review Questions
- suggestions for related lab assignments and class projects not included in the Student Study Guide
- bibliographic list for additional research

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#### **Student Study Guide**

The Student Study Guide includes space for answering in-text review questions, projects with related worksheets, crossword puzzles, and references for each chapter. Answers are not printed in the Study Guide; they can be found in the Instructor's Manual only.

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#### **Computerized and Printed Testbank**

Over 2000 true/false, multiple-choice, and fill-in questions correspond to the Review Questions in the text. These are available both in printed form and on disk with the McGraw-Hill Test Generator.

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### Transparency Masters

Two sets of transparency masters support the text. The first contains black and white reproductions of figures found in *Computers!.* These masters are keyed to the lecture outline in the Instructor's Manual. The second set is in full color. These color transparencies were designed to supplement figures and concepts from the text.

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### Broadcast Quality Videotapes

"Computers at Work," the popular documentary-style videocourse that is broadcast extensively by PBS and numerous statewide consortia, complements this new edition of *Computers!.* This video series can be supplemented by the Student Videocourse Manual, which keys reading assignments in *Computers!.* to each of the following video lessons:

- |                                 |  |
|---------------------------------|--|
| 1. The Information Age          | 7. Database Systems                        |
| 2. The Computer System          | 8. Microcomputers                          |
| 3. Computer Hardware            | 9. Computers and Society                   |
| 4. Computer Software            | 10. Artificial Intelligence and the Future |
| 5. Business Systems Development | 11. Computer Crime, Viruses, and Security  |
| 6. Computer Communications      | 12. Computer Careers                       |

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### Application Software and Manuals

A variety of hands-on tutorials are available both with and without software. Applications packages covered include current versions of IBM and Macintosh operating systems; wordprocessing, spreadsheet, database, and integrated software; and commercial software and shareware. For a current list of these materials, contact your McGraw-Hill sales representative.

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David R. Adams contributed material for the Macintosh tutorial in Appendix C. C. Brian Honess developed the BASIC tutorial for



Appendix D. Many of the “conventional wisdoms” presented in Appendix E can be credited to Roger Carlson, whose own wisdom was a great contribution to this manuscript. Jeff Stipes’ work on spreadsheets from *Software Tools in Business* (Mitchell/McGraw-Hill, 1991) was the inspiration for Chapter 5. Nor can we forget David Kroenke’s five-component model and insights about business systems, which are still solid after four editions. To each of these individuals, a very special thank you.

Finally, we would like to thank these people for their assistance with *Computers!* in both this and previous editions: Geoff Alexander, Cabrillo College; Julius Archibald, Plattsburgh State University; Gary Armstrong, Shippensburg University; Kathryn Baalman, St. Charles County Community College; Dr. Bauers, Fairmont State College; Jim Blaisdale, Humboldt State University; Don Bogema, Muskegon Community College; Jack Breglio, Rancho Santiago College; Susan Brender, Boise State University; Harry Brown, Muskegon Community College; Bruce Burns, Fish-Are-Us; Keith Carver, Sacramento City College; Lee Cornell, Mankato State University; William Cornette, Southwest Missouri State University; Steve Deam, Milwaukee Area Technical College; Kent DeYoung, Muskegon Community College; Pat Fenton, West Valley College; Marie Flatley, San Diego State University; Janet Gerth, Essex Community College; Professor Haag, University of South Florida; Terry Hamberger, York College of Pennsylvania; Rick Hamill, Beech Tree Farm; Cindy Hanchey, Oklahoma Baptist College; Frank Hannum, Eight-Bit Corner; Greg Hodge, Northwestern Michigan College; Enid Irwin, Santa Monica College; Peter Irwin, Richland College; Maribeth King, Kigore College; Linda Knight, Northern Illinois University; Linda Lantz, Community College of Aurora; Thom Luce, Ohio University; James Mathews, Siena College; Lynn McAustin, Cuesta College; Paula McClurg-Ziemelis, Muskegon Community College; Richard Otto, REO Consulting; Michael Michaelson, Palomar College; Blair Morrissey, Muskegon Community College; Patti Nunnally, John Tyler Community College; Randy Pidhayny, Silicon Graphics; Robert Pobasco, University of Idaho; Daniel Randles, General Telephone; Herb Rebhun, University of Houston - Downtown; John Salzieder, Phillips University; Rosemary Skeelee, Seton Hall University; Rod Southworth, Laramie County Community College; Jesse Sprayberry, Muskegon Area Skills Training Center; Roger Stoel, Muskegon Community College; Earl Talbert, Central Piedmont Community College; Nancy Tate, Washburn University; Antony Tiona, Broward Community College; Todd Trainor, Dow Chemical Corporation; Kenneth Walker, Weber State University; Randy Weinberg, St. Cloud State University; David Wen, Diablo Valley College; Dave Wenk, Martin-Marietta Corporation; David Whitney, San Francisco State University; Francis Whittle, Dutchess Community College; and Louis Wolff, Moorpark College.

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# Computers!

**Fourth Edition**

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