DISCOVERING COMPUTERS 98

A Link to the Future

World Wide Web Enhanced

SHELLY CASHMAN SERIES®

Shelly
Cashman
Waggoner

DISCOVERING COMPUTERS 98

A Link to the Future

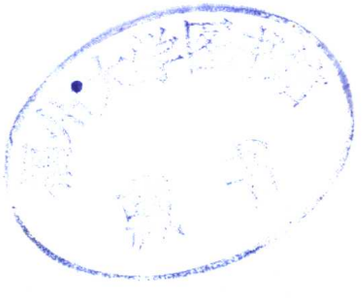
World Wide Web Enhanced

本书配有光盘，需要者请到网络光盘实验室拷贝

Gary B. Shelly
Thomas J. Cashman
Gloria A. Waggoner
William C. Waggoner

Contributing Authors

Misty E. Vermaat
Tim J. Walker
Tom L. Hall
John F. Repede



SHELLY CASHMAN SERIES®

COURSE TECHNOLOGY
ONE MAIN STREET
CAMBRIDGE MA 02142

an International Thomson Publishing company ITP®

CAMBRIDGE • ALBANY • BONN • CINCINNATI • LONDON • MADRID • MELBOURNE
MEXICO CITY • NEW YORK • PARIS • SAN FRANCISCO • TOKYO • TORONTO • WASHINGTON

Printed in the United States of America

For more information, contact:

Course Technology
One Main Street
Cambridge, Massachusetts 02142, USA

ITP Europe
Berkshire House
168-173 High Holborn
London, WC1V 7AA, United Kingdom

ITP Australia
102 Dodds Street
South Melbourne
Victoria 3205 Australia

ITP Nelson Canada
1120 Birchmount Road
Scarborough, Ontario
Canada M1K 5G4

International Thomson Editores
Saneca, 53
Colonia Polanco
11560 Mexico D.F. Mexico

ITP GmbH
Konigswinterer Strasse 418
53227 Bonn, Germany

ITP Asia
60 Albert Street, #15-01
Albert Complex
Singapore 189969

ITP Japan
Hirakawa-cho Kyowa Building, 3F
2-2-1 Hirakawa-cho, Chiyoda-ku
Tokyo 102, Japan

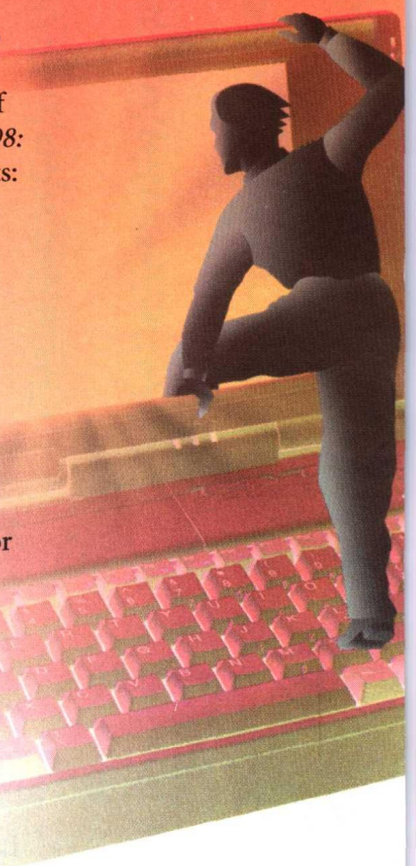
ISBN 0-7895-4531-4

2 3 4 5 6 7 8 9 10 BC 02 01 00 99 98

PREFACE

In 1997, the Shelly Cashman Series team produced *Discovering Computers: A Link to the Future, World Wide Web Enhanced* for the Introduction to Computers course. This textbook became an instant best-seller. Its popularity was due to: (1) the integration of the World Wide Web; (2) currency of the material; (3) readability; (4) exercises; (5) student supplements; and (6) the ancillaries that allow a teacher to teach the way he or she wants to teach. Because of the improvements in the delivery of Web-based material, the desire of many instructors to organize their campus-based courses on the Web, and the increasing importance of distance education, the Shelly Cashman Series team now has produced *Discovering Computers 98: A Link to the Future, World Wide Web Enhanced.* This new edition includes these enhancements:

- Updates of the latest hardware, software, and trends in the computer field
- All figures illustrating software replaced using the latest version of the software
- Access to CyberClass, a Web-based teaching and learning system, that can be used in a traditional campus setting or distance learning setting
- Audio Chapter Review, available on the Web or on CD-ROM, offers a unique way for students to solidify and reinforce the concepts presented in a chapter



Objectives of This Textbook

Discovering Computers 98: A Link to the Future, World Wide Web Enhanced is intended for use in a one-quarter or one-semester introductory computer course. No experience with computers is assumed. The material presented provides the most in-depth treatment of introductory computer subjects ever found in a textbook. Students will finish the course with a complete understanding of computers, how to use computers, and how to access information on the World Wide Web. The objectives of this book are as follows:

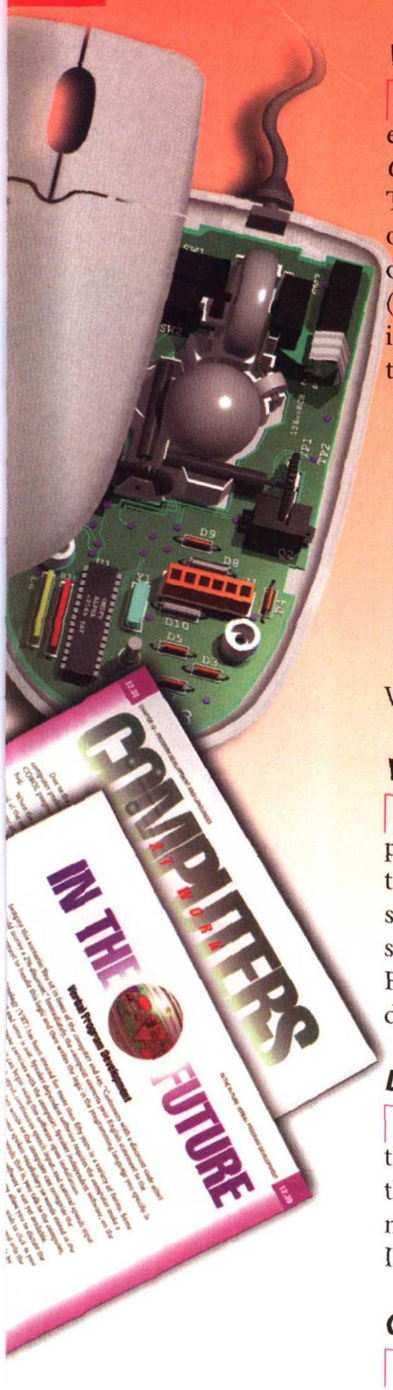
- Present the fundamentals of computers and computer nomenclature, particularly with respect to personal computer hardware and software and the World Wide Web
- Make use of the World Wide Web as a repository of the latest information
- Present the material in a visually appealing and exciting, easy-to-understand manner with a format that invites students to learn
- Give students an in-depth understanding of why computers are essential components in the business world and society in general
- Use a fully integrated, hands-on approach to foster an appreciation of the World Wide Web
- Focus on the computer as a valuable productivity tool
- Recognize the personal computer's position as the backbone of the computer industry and emphasize its use as a stand-alone and networked device
- Provide exercises and lab assignments that allow students to interact with a computer and actually learn by using the computer and the World Wide Web
- Present strategies for purchasing, installing, and maintaining a personal computer system

Distinguishing Features

Discovering Computers 98: A Link to the Future, World Wide Web Enhanced includes the following distinguishing features.

The Proven Shelly and Cashman Pedagogy

More than two million students have learned about computers using Shelly and Cashman computer fundamentals textbooks. This enhanced version of the previous edition is our best work ever. With CyberClass and additional World Wide Web integration, extraordinary visuality, currency, and the Shelly and Cashman touch, students and teachers alike will find this to be the finest textbook they have ever used.



World Wide Web Enhanced

Each of the Shelly and Cashman computer fundamentals books has included significant educational innovations that have set them apart from all other textbooks in the field. *Discovering Computers 98* continues this tradition of innovation with its integration of the World Wide Web. The purpose of integrating the World Wide Web into the book is to: (1) offer instructors the opportunity to organize and administer their campus-based or distance-education-based course on the Web using CyberClass; (2) offer students additional information on a topic of importance; (3) provide currency; and (4) underscore the relevance of the World Wide Web as a basic information tool that can be used in all facets of society. The World Wide Web is integrated into the book in three central ways:

- CyberClass Web-based teaching and learning system as described on page xiv.
- Throughout the text, marginal annotations titled *inCyber* provide suggestions on how to obtain additional information via the Web on an important topic covered on the page.
- Every end-of-chapter page in the book has been stored as a Web page on the World Wide Web. While working on an end-of-chapter page, students can display the corresponding Web page to obtain additional information on a term or exercise and to study for exams. See page xv for more information.

This textbook, however, does not depend on Web access in order to be used successfully. The Web access adds to the already complete treatment of topics within the book.

Visually Appealing

Using the latest technology, the pictures, drawings, and text have been artfully combined to produce a visually appealing and easy-to-understand book. Pictures and drawings reflect the latest trends in computer technology. The pictures, which were chosen for their pedagogical value, allow students to see the actual hardware, software, and other subjects being described in the book. The state-of-the-art drawings are geared toward simplifying the more complex computer concepts. Finally, the text on each page was set to make the book easy to read. This combination of pictures, drawings, and text sets a new standard for computer textbook design.

Latest Computer Trends

The terms and technologies your students see in this book are those they will encounter when they start using computers. Only the latest application software packages are shown throughout the book. New topics and terms include Pentium II chips, MMX™ technology, DVD-ROMS, network computers, intranets, firewalls, HTML, Java, VBA, Windows 98, Windows CE, T1 lines, ISPs, TCP/IP, MAEs, IP address, MPEG compression, "cookies," and much more.

Chapters on The Internet and the World Wide Web, and on Multimedia

Chapter 7 covers the Internet and the World Wide Web, which is the fastest growing area of computer technology. Topics include how the Internet works; browsers; URLs; search tools; firewalls; intranets; and Internet services. Chapter 14 introduces students to the latest multimedia technology. Topics include multimedia applications and the types of media used in the applications; multimedia hardware and software; and a discussion of leading multimedia software.

Computers at Work and In the Future

Each chapter ends with two full pages devoted to features titled *Computers at Work* and *In the Future*. *Computers at Work* presents an example of how the concepts in the chapter are being used today. *In the Future* describes an application that will be available in the future using concepts presented in the chapter.

Shelly Cashman Series Interactive Labs

Eighteen unique, hands-on exercises, developed specifically for this book, allow students to use the computer to learn about computers. Each Lab exercise takes students about 15 minutes to step through. Assessment is available. The Interactive Labs are described in detail on page xvi. These same Labs are available free on the Web or on CD-ROM for an additional cost (ISBN 0-7895-4595-0).

End-of-Chapter Exercises

Unlike other books on the subject of computer fundamentals, a major effort was undertaken in *Discovering Computers 98* to offer exciting, rich, and thorough end-of-chapter material to reinforce the chapter objectives and assist you in making your course the finest ever offered. As indicated earlier, each and every one of the end-of-chapter pages is stored as a Web page on the World Wide Web to provide your students in-depth information and alternative methods of preparing for examinations. Each chapter ends with the following:

- **review** This section summarizes the chapter material for the purpose of reviewing and preparing for examinations. Links on the Web page provide additional current information. With a single click on the Web page, the review section is read to the student using streaming audio.
- **terms** This listing of the key terms found in the chapter together with the page on which the terms are defined will aid students in mastering the chapter material. A complete summary of all key terms in the book, together with their definitions, appears in the Index at the end of the book. On the Web page, students can click terms to view a definition of the term and a picture of the term.
- **yourTurn** Fill-in and short-answer questions, together with a figure from the chapter that must be labeled, reinforce the material presented within the chapter. Students accessing the Web page can click a question to see a suggested answer.
- **hotTopics** The computer industry is not without its controversial issues. At the end of each chapter, several scenarios are presented that challenge students to critically examine their perspective of technology in society. The Web pages provide links to challenge students further.
- **cyberClass** These exercises have students connect to the CyberClass web page where they complete tasks that include online flash cards; practice tests; e-mail; bulletin board activities; visiting and evaluating Web sites; and CyberChallenge.
- **winLabs** To complete their introduction to computers, students must interact with and use a computer. A series of Windows Lab exercises begin with the simplest exercises within Windows, and then students are led through additional activities that, by the end of the book, will enable them to be proficient in using Windows. Also included in this section are exercises that have students complete the Shelly Cashman Series Interactive Labs. These Interactive Labs can be completed directly from the World Wide Web.
- **webWalk** In this section, students gain an appreciation for the World Wide Web by visiting interesting and exciting Web pages and completing suggested tasks. The last exercise sends students into a Chat room where they can discuss topics presented in the book with other students throughout the world.

Milestones in Computer History

A colorful, highly informative eight-page timeline following Chapter 1 steps students through the major computer technology developments over the past 50 years, including the most recent advances and a glimpse of the future.

Guide to World Wide Web Sites

More than 100 popular Web sites are listed and described in a new guide to Web sites that follows Chapter 7.

How to Purchase, Install, and Maintain a Personal Computer

A nine-page student guide following Chapter 8 introduces students to purchasing, installing, and maintaining a desktop or laptop personal computer.

Careers in the Information Age

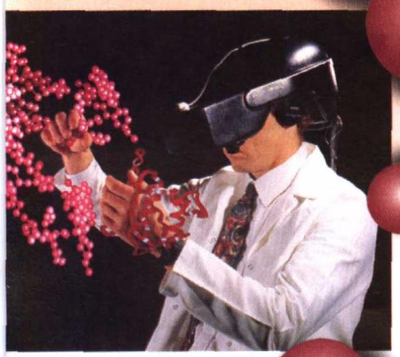
This special feature following Chapter 12 provides students with practical information on careers in the computer field and covers prerequisites to maximize their potential opportunities.

Virtual Reality

Following Chapter 14, an eight-page special feature introduces students to the amazing world of virtual reality and how computers are used to create artificial environments they can experience.

Instructor's Support Materials

A comprehensive instructor's support package accompanies this textbook in the form of two CD-ROM packages. The two packages titled Instructor's Resource Kit (IRK) and Course Presenter are described in the following sections. Both packages are available free to adopters.



Instructor's Resource Kit (IRK)

The Instructor's Resource Kit (IRK) includes teaching and testing aids. The CD-ROM (ISBN 0-7895-4533-0) is available through your Course Technology representative or by calling one of the following telephone numbers: Colleges and Universities, 1-800-648-7450; High Schools, 1-800-824-5179; and Career Colleges, 1-800-477-3692. The contents of the IRK are listed below.

- **ElecMan (Electronic Instructor's Manual)** ElecMan is made up of Microsoft Word files. The ElecMan files include the following for each chapter: chapter objectives; chapter overview; detailed lesson plans with page number references; teacher notes and activities; answers to the *winLabs* exercises; test bank (100 true/false, 50 multiple-choice, and 70 fill-in-the-blank questions per chapter); and transparency references. The transparencies are available in Figures on CD-ROM. The test bank questions are numbered the same as in Course Test Manager. You can print a copy of the chapter test bank and use the printout to select your questions in Course Test Manager. You also can use your word processor to generate quizzes and exams from the test bank.
- **Figures on CD-ROM** Illustrations for every picture, table, and screen in the textbook are available in electronic form. Use this ancillary to present a slide show in lecture or to print transparencies for use in lecture with an overhead projector. If you have a personal computer and LCD device, this ancillary can be a powerful tool for presenting your lectures.
- **Course Test Manager** Course Test Manager is a powerful testing and assessment package that enables instructors to create and print tests from the large test bank. Instructors with access to a networked computer lab (LAN) can administer, grade, and track tests online. Students also can take online practice tests, which generate customized study guides that indicate where in the textbook students can find more information for each question.
- **Offline Web Companion** The Offline Web Companion includes a fully functional copy of the Microsoft Internet Explorer Web browser and all the *inCyber* Web pages referenced in the margins of the book. This system allows your students to access the *inCyber* Web pages without being connected to the Internet.
- **Interactive Labs** Non-audio version of the eighteen hands-on Interactive Labs exercises that take students about fifteen minutes each to step through help solidify and reinforce computer concepts. Student assessment requires students to answer questions about the contents of the Interactive Labs.
- **winLabs Solutions** These files contain the solutions to the *winLabs* exercises including answers to the assessment questions for the Shelly Cashman Series Interactive Labs.

Course Presenter

Course Presenter (ISBN 0-7895-4537-3) is a multimedia lecture presentation system for *Discovering Computers 98* that provides PowerPoint slides for every subject in each chapter. Use this presentation system to present well-organized lectures that are both interesting and knowledge-based. Fourteen presentation files are provided for the book, one for each chapter. Each file contains PowerPoint slides for every subject in each chapter together with *optional choices* to show any figure in the chapter as you step though the material in class. More than 40 current, two- to three-minute video clips and more than 35 animations that reinforce chapter material also are available for *optional presentation*. Course Presenter provides consistent coverage for multiple lecturers.

Supplements

Three supplements can be used in conjunction with *Discovering Computers 98: A Link to the Future, World Wide Web Enhanced.* These supplements reinforce the computer concepts presented in the book.

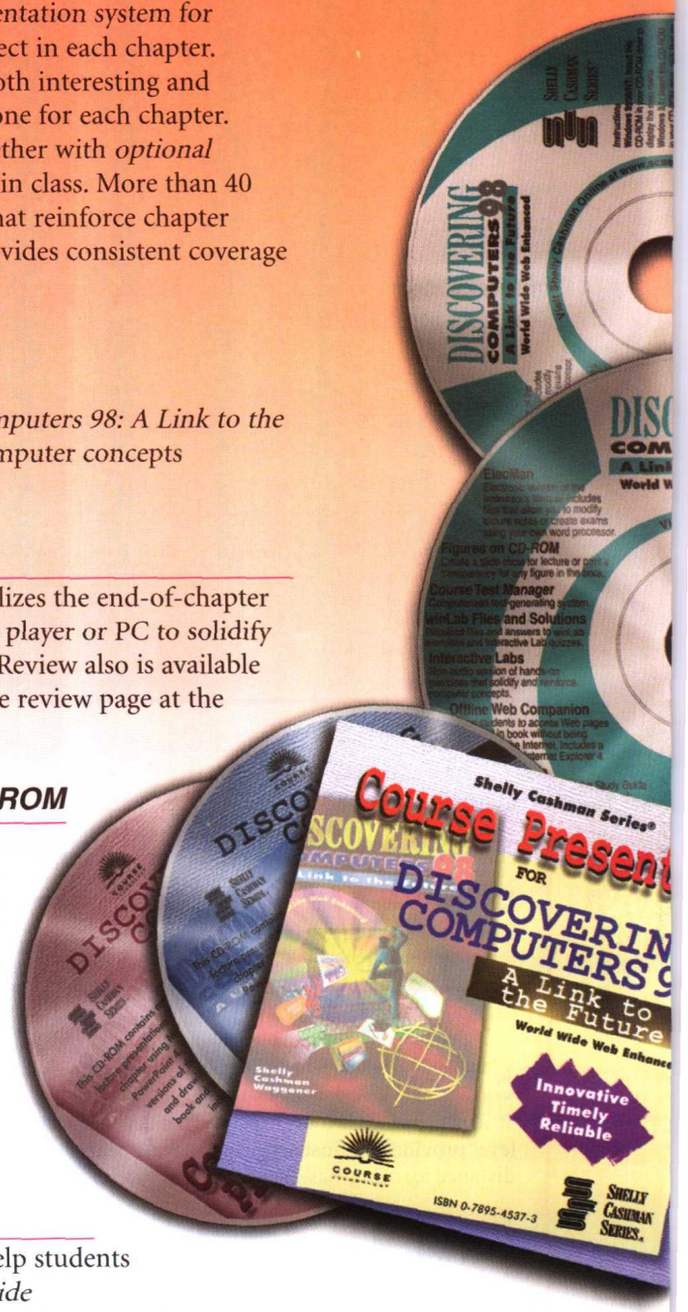
Audio Chapter Review on CD-ROM

The Audio Chapter Review on CD-ROM (ISBN 0-7895-4594-2) vocalizes the end-of-chapter review pages (see page 1.28). Students can use this supplement with a CD player or PC to solidify their understanding of the concepts presented. This same Audio Chapter Review also is available at no cost on the Web by clicking the Audio Chapter Review button on the review page at the end of any chapter.

Shelly Cashman Series Interactive Labs with Audio on CD-ROM

The Shelly Cashman Series Interactive Labs with Audio on CD-ROM (ISBN 0-7895-4595-0) may be used in combination with this textbook to augment your students' learning process. See page xvi for a description of each lab. These Interactive Labs also are available at no cost on the Web by clicking the appropriate link on the *winLabs* exercise pages (see page 1.34).

Record of Discovery (ISBN 0-7895-2841-X) also can be used with the Shelly Cashman Series Interactive Labs. Students use this unique journal to chronicle, analyze, and extend their experiences with the CD-ROM or Web version of the Interactive Labs.



Study Guide

This highly popular supplement includes a variety of activities that help students recall, review, and master introductory computer concepts. The *Study Guide* complements the end-of-chapter material with short answer, fill-in, and matching questions, along with other challenging exercises.

Shelly Cashman Online

Shelly Cashman Online is a World Wide Web service available to instructors and students of computer education. Visit Shelly Cashman Online at www.scseries.com. Shelly Cashman Online is divided into four areas:

- **Series Information** Information on the Shelly Cashman Series products.
- **Teaching Resources** This area includes password-protected data, course outlines, teaching tips, and ancillaries such as ElecMan.
- **Student Center** Dedicated to students learning about computers with Shelly Cashman Series textbooks and software. This area includes cool links and much more.
- **Community** Opportunities to discuss your course and your ideas with instructors in your field and with the Shelly Cashman Series team.

Acknowledgments

The Shelly Cashman Series would not be the most successful computer textbook series ever published without the contributions of outstanding publishing professionals. First, and foremost, among them is Becky Herrington, director of production and designer. She is the heart and soul of the Shelly Cashman Series, and it is only through her leadership, dedication, and untiring efforts that superior products are produced.

Under Becky's direction, the following individuals made significant contributions to this book: Ginny Harvey, series specialist and developmental editor; Ken Russo, senior graphic designer/Web developer; Mike Bodnar and Mark Norton, graphic artists; Stephanie Nance, graphic artist and cover designer; Jeanne Black, Quark expert; Nancy Lamm, proofreader; Sarah Evertson of Image Quest, photo researcher; and Cristina Haley, indexer. Special thanks go to Jim Quasney, our dedicated series editor; Lisa Strite, senior editor; Lora Wade, associate product manager; Tonia Grafakos, editorial assistant; Jon Langdale, online developer; and Kathryn Coyne, project marketing manager.

Our sincere thanks go to Dennis Tani, who together with Becky Herrington, designed this book. In addition, Dennis performed all the initial layout, typography, and executed the magnificent drawings contained in this book.

Thanks go to Barbara Ellestad, Michael McQuead, Harry Rosenblatt, and Tim Sylvester, for reviewing the manuscript and to Darrell Ward of *Hyper*Graphics Corporation for development of CyberClass.

The efforts of our three contributing authors, John Repede, Misty Vermaat, and Tim Walker, on the chapter-ending material helped make this book extraordinary. Also, thanks to Misty Vermaat for Chapters 11 and 12 and Tom Hall for Chapter 14. We hope you find using this book an exciting and rewarding experience.

Gary B. Shelly
Thomas J. Cashman

Gloria A. Waggoner
William C. Waggoner

CyberClass — A Web-Based Teaching and Learning System

CyberClass is a Web-based teaching and learning system that adopters of *Discovering Computers 98: A Link to the Future, World Wide Web Enhanced* can use in a traditional campus setting or distance learning setting. CyberClass is available in three levels so you can choose the one that best fits your course needs.

CyberClass Level I – Free to adopters of this book

Students access this level by using their browser to display the www.cyber-class.com Web site. Level I includes:

- Twenty-five interactive flash cards per chapter that serve as a self-study aid to help students master chapter content
- Practice tests that enable students to test their mastery of a chapter; includes study guide feedback
- Case scenarios that show how corporations use computers
- A link to this book's award-winning Web site

CyberClass Level II – Available for an additional cost

Students purchase a floppy disk that allows access to this level. Level II access also requires a class key, user-id, and password. This level provides the instructor with a customizable and secure Web site that can be used to organize and administer a campus-based or distance learning-based course. This level offers both student and instructor these important educational tools:

For the Student

- Access to all CyberClass Level I capabilities
- Read class syllabi posted by the instructor
- Read assignments posted by the instructor
- Send messages to and receive messages from class members and instructors
- Submit assignments electronically to instructor
- Access to a student bulletin board
- Post hot links for class members
- Electronic flash cards for every bold term in the book, organized by chapter
- CyberChallenge, a self-study game

For the Instructor

- Post class syllabi
- Post weekly assignments
- Create and edit a class roster
- Send messages and receive messages and assignments from students
- Web-based testing using Course Test Manager
- Supervised chat, which can be used for online office hours, mini-lectures, group work, discussion groups, and more

CyberClass Level III – Available for an additional cost

Students purchase a floppy disk that allows access to this level. Level III access also requires a class key, user-id, and password. This level provides the following:

- All the capabilities of Level I and Level II
- Audio-conferencing, which allows instructor and students to meet for Web-based lectures
- Live assessment, which allows instructors to send questions real-time to students who then respond back immediately

Notes to the Student

If you have access to the World Wide Web, you can obtain current and additional information on topics covered in this book in three ways:

1. Throughout the book, marginal annotations called *inCyber* specify subjects about which you can obtain additional current information. Enter the designated URL and then click the appropriate term on the Web page.
2. Each chapter ends with seven sections titled *review*, *terms* (Figure 1), *yourTurn*, *hotTopics*, *cyberClass*, *winLabs*, and *webWalk*. The pages in your book are stored as Web pages on the Web. You can visit them by starting your browser and entering the URL in the Address box at the top of the page. When the Web page displays, you can click links on the page to broaden your understanding of the topics and obtain current information about the topic.
3. Using CyberClass, the Web-based learning system described on the facing page.

Use the sections titled *terms* and *yourTurn* to prepare for examinations. In the *terms* section, display the Web page in your browser and then scroll through the terms. If you do not know the definition of a term, click the term on the Web page for its definition and a picture relating to it. Click the rocket ship to display a Web page with additional current information about the term. In the *yourTurn* section, determine your answer to a question and then click the blank line to see the suggested answer.

Each time you reference a Web page from *Discovering Computers 98*, a navigation bar displays (Figure 1). To display a section within a chapter, click the chapter number and then click the section name. For instance, in Figure 1, to display the *cyberClass* page for Chapter 5, click chapter number 5 and then click cyberClass. If the chapter number you want already displays in the navigation bar (example: chapter number 1 in Figure 1), then simply click the section you want.

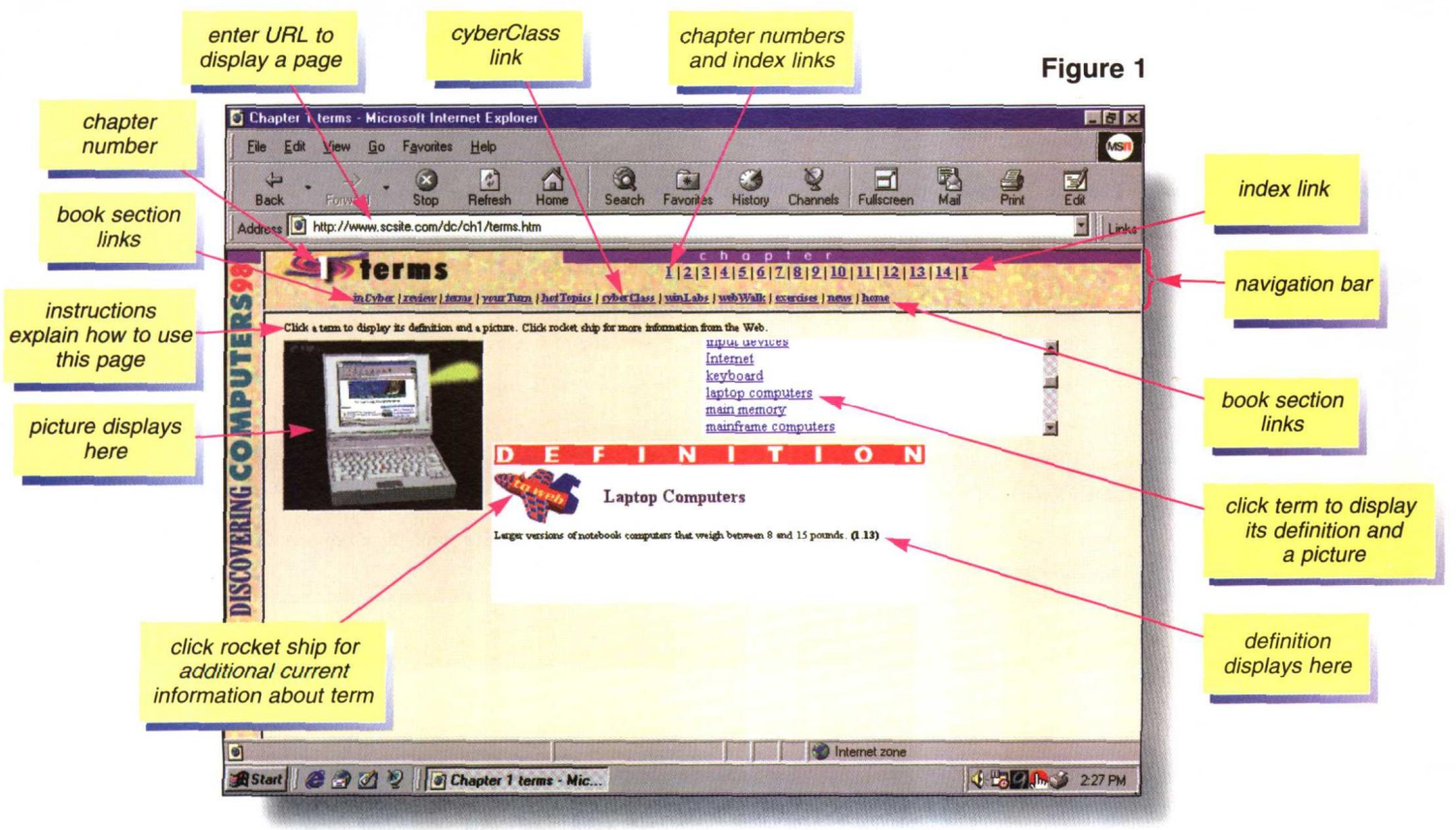
The exercises link displays a page containing links to all exercises in all chapters of the book. The news link displays pages that contain daily news about topics in each chapter of the book. The home link displays the home page for the *Discovering Computers 98* book. On the home page, if you click any of the section names, a page displays that contains links to the section for all chapters in the book. The index link contains an index/glossary for the entire book, together with definitions and appropriate pictures.

inCyber annotations provide additional current information on a topic

inCyber

For information on aspects of the Internet, including search tools, chat rooms, and home page creation, visit the Discovering Computers 98 Chapter 1 inCyber page (www.scsite.com/dc98/ch1/incyber.htm) and click Internet.

Figure 1



Shelly Cashman Series Interactive Labs with Audio

Each of the fourteen chapters in this book includes the *winLabs* hands-on exercises. The eighteen Shelly Cashman Series Interactive Labs described below are included as exercises in the *winLabs* section. These Interactive Labs are available on the Web (see page 1.34) or on CD-ROM. The CD-ROM version is available at an additional cost. Each lab takes the students approximately 15 minutes to complete using a personal computer and helps them gain a better understanding of a specific subject covered in the chapter.

Shelly Cashman Series Interactive Labs with Audio

Lab	*Function*	*Page*
Using the Mouse	Master how to use a mouse. The Lab includes exercises on pointing, clicking, double-clicking, and dragging.	1.34
Using the Keyboard	Learn how to use the keyboard. The Lab discusses different categories of keys, including the edit keys, function keys, ESC, CTRL, and ALT keys and how to press keys simultaneously.	1.34
Word Processing	Gain a basic understanding of word processing concepts, from creating a document to printing and saving the final result.	2.46
Working with Spreadsheets	Learn how to create and utilize spreadsheets, including entering formulas, creating graphs, and performing what-if analysis.	2.46
Understanding the Motherboard	Step through the components of a motherboard and build one by adding components. The Lab shows how different motherboard configurations affect the overall speed of a computer.	3.36
Scanning Documents	Understand how document scanners work.	4.53
Setting Up to Print	See how information flows from the system unit to the printer and how drivers, fonts, and physical connections play a role in generating a printout.	4.53
Configuring Your Display	Recognize the different monitor configurations available, including screen size, display cards, and number of colors.	4.53
Maintaining Your Hard Drive	Understand how files are stored on disk, what causes fragmentation, and how to maintain an efficient hard drive.	5.32
Exploring the Computers of the Future	Learn about computers of the future and how they will work.	6.43
Connecting to the Internet	Learn how a computer is connected to the Internet. The Lab presents using the Internet to access information.	7.39
The World Wide Web	Understand the significance of the World Wide Web and how to use Web browser software and search tools.	7.39
Evaluating Operating Systems	Evaluate the advantages and disadvantages of different categories of operating systems.	8.32
Working at Your Computer	Learn the basic ergonomic principles that prevent back and neck pain, eye strain, and other computer-related physical ailments.	8.32
Designing a Database	Create a database structure and optimize a database to support searching.	9.35
Choosing a Programming Language	Differentiate between traditional languages and the newer object-oriented languages.	12.46
Keeping Your Computer Virus Free	Learn what a virus is and about the different kinds of viruses. The Lab discusses how to prevent your computer from being infected with a virus.	13.39
Understanding Multimedia	Gain an understanding of the types of media used in multimedia applications, the components of a multimedia PC, and the newest applications of multimedia.	14.41

Contents

DISCOVERING COMPUTERS 98

A Link to the Future, World Wide Web Enhanced

CHAPTER 4
Input and Output

CHAPTER 5
Data Storage

CHAPTER 6
Communications and Networks

CHAPTER 7
The Internet and the World Wide Web

CHAPTER 11
Information Systems Development

CHAPTER 12
Program Development and Programming Languages

CHAPTER 13
Security, Privacy, and Ethics

CHAPTER 14
Multimedia