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DISCOVERING COMPUTERS 2000

Concepts for a Connected World

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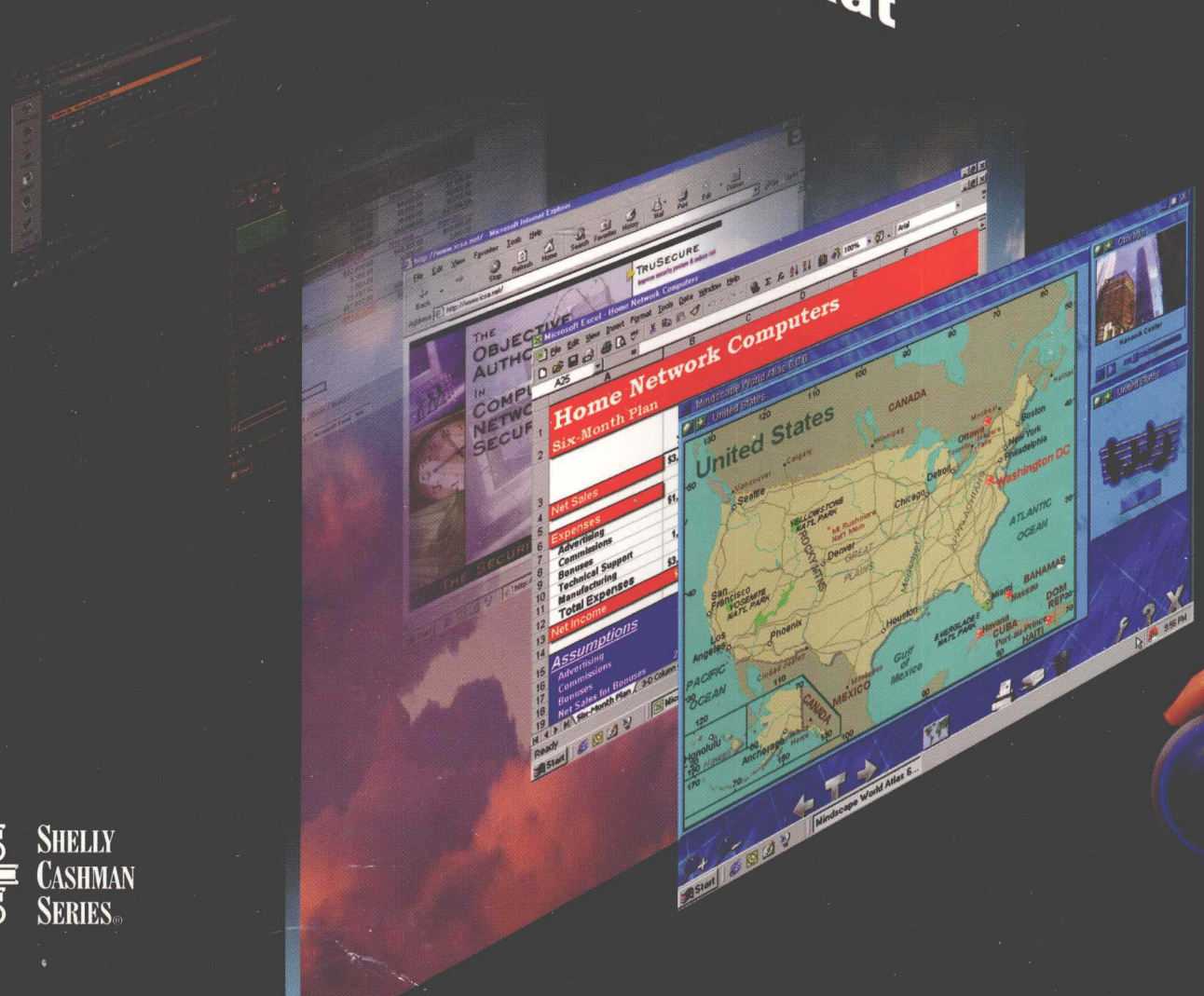

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DISCOVERING COMPUTERS 2000

Concepts for a Connected World

Web and CNN Turner Learning Enhanced

Gary B. Shelly
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Misty E. Vermaat
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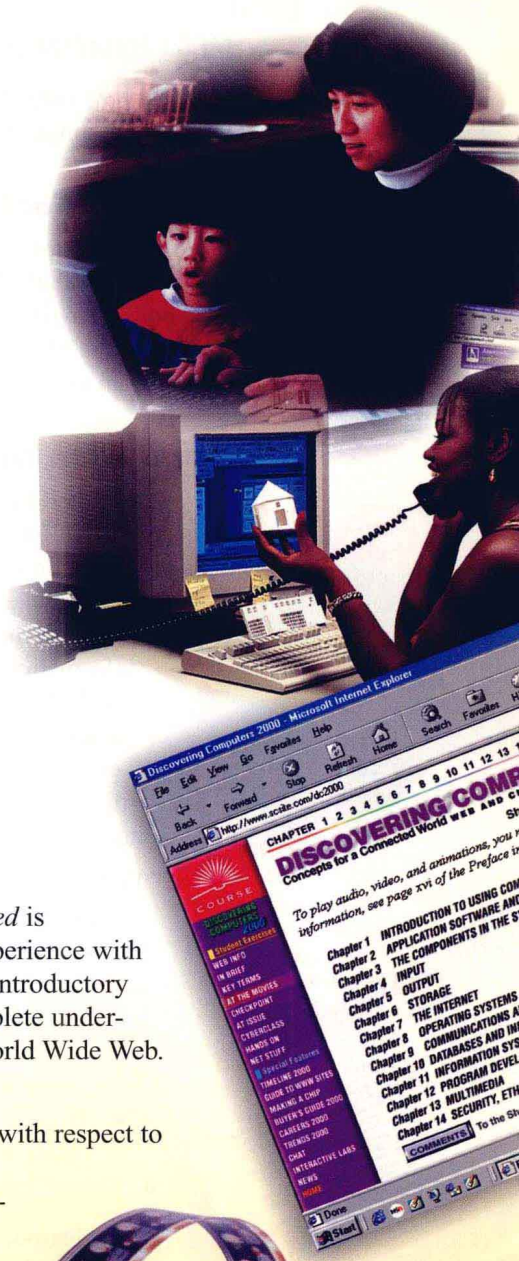
PREFACE

The previous four editions of this textbook have been runaway best-sellers. Each of the these editions included new learning innovations such as integration of the World Wide Web, CyberClass, Interactive Labs, and Teaching Tools that set it apart from its competitors. *Discovering Computers 2000: Concepts for a Connected World, Web and CNN Enhanced* continues with the innovation, quality, and reliability that you have come to expect from the Shelly Cashman Series®. The newest edition of *Discovering Computers* includes these enhancements:

- Updates of the latest hardware, software, and trends in the computer field with particular emphasis placed on the personal computer and its practical use
- An exercise section at the end of each chapter titled AT THE MOVIES that includes streaming up-to-date, computer-related CNN videos on the Web; these videos offer a unique way for students to solidify, reinforce, and extend the concepts presented in the chapter
- Step-by-step illustrations that significantly simplify the complexity of the computer concepts presented
- Chapter-ending sections titled Technology Trailblazer and Company on the Cutting Edge; these one-page briefs introduce students to the people and companies they should know as they move into the job market
- Web pages with dramatically improved functionality



OBJECTIVES OF THIS TEXTBOOK

Discovering Computers 2000: Concepts for a Connected World, Web and CNN 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:

- Teach the fundamentals of computers and computer nomenclature, particularly with respect to personal computer hardware and software, and the World Wide Web
- Give students an in-depth understanding of why computers are essential components in business and society in general
- Make use of the World Wide Web as a repository of the latest information and as an integrated learning tool
- Present the material in a visually appealing and exciting manner that invites students to learn
- Offer alternative learning techniques with streaming audio and video on the Web
- 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
- Assist students in planning a career in the computer field

DISTINGUISHING FEATURES

Discovering Computers 2000: Concepts for a Connected World, Web and CNN Enhanced includes the following distinguishing features.

A Proven Book

More than three million students have learned about computers using Shelly and Cashman computer fundamentals textbooks. With the additional World Wide Web integration and interactivity, streaming up-to-date, computer-related CNN videos, extraordinary visual drawings and photographs, unprecedented currency, and the Shelly and Cashman touch, this book will make your computer concepts course exciting and dynamic, an experience your students will remember as a highlight of their educational careers.

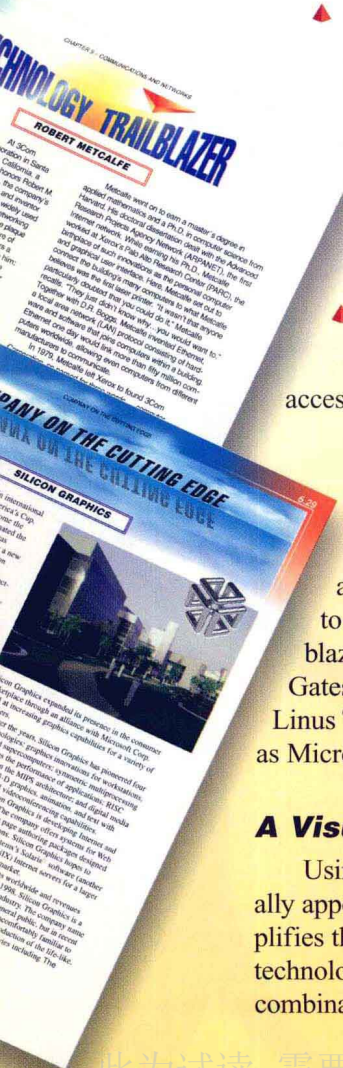
World Wide Web and CNN Enhanced

Each of the Shelly Cashman Series computer fundamentals books has included significant educational innovations that have set them apart from all other textbooks in the field. *Discovering Computers 2000* sustains this tradition of innovation with its continued integration of the World Wide Web and the agreement with CNN to make available its up-to-date, computer-related videos on the Web.

The purpose of integrating the World Wide Web into the book is to (1) offer students additional information and currency topics of importance; (2) make available alternative learning techniques with Web-based streaming audio and up-to-date, computer-related CNN videos; (3) underscore the relevance of the World Wide Web as a basic information tool that can be used in all facets of society; and (4) offer instructors the opportunity to organize and administer their campus-based or distance-education-based courses on the Web using CyberClass. The World Wide Web is integrated into the book in four central ways:

- End-of-chapter pages and most of the special features in the book have been stored as Web pages 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 get an alternative point of view. See page xv for more information.
- Streaming audio on the Web in the end-of-chapter IN BRIEF sections, streaming up-to-date, computer-related CNN videos on the Web in the end-of-chapter AT THE MOVIES sections, and the Interactive Labs in the end-of-chapter NET STUFF sections on the Web.
- Throughout the text, marginal annotations titled WEB INFO provide suggestions on how to obtain additional information via the Web on an important topic covered on the page.
- CyberClass Web-based teaching and learning system as described on page xiv.

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.



Technology Trailblazer and Company on the Cutting Edge Features

Every student graduating from an institution of higher education should be aware of the leaders and major companies in the field of computers. Thus, each chapter ends with two full pages devoted to features titled Technology Trailblazer and Company on the Cutting Edge. The Technology Trailblazer feature presents people who have made a difference in the computer revolution, such as Bill Gates, Larry Ellison, Steve Wozniak, Steve Jobs, Marc Andreessen, Tim Berners-Lee, Michael Dell, and Linus Torvalds. The Company on the Cutting Edge feature presents the major computer companies, such as Microsoft, Sun Microsystems, AOL, SAP, Compaq, and IBM.

A Visually Appealing Book that Maintains Student Interest

Using the latest technology, pictures, drawings, and text have been artfully combined to produce a visually appealing and easy-to-understand book. Many of the figures show a step-by-step pedagogy, which simplifies the more complex computer concepts. Pictures and drawings reflect the latest trends in computer technology. Finally, the text was set in two columns, which research shows is easier for students to read. This combination of pictures, step-by-step drawings, and text sets a new standard for computer textbook design.

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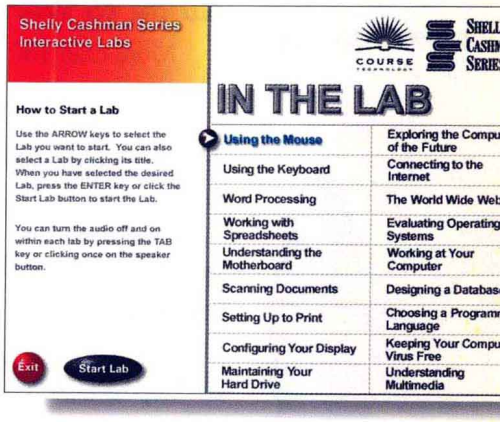
Latest Computer Trends

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® III and Pentium® Xeon™ chips; Microsoft Windows 2000; Microsoft Office 2000; IrDA ports; the latest on the World Wide Web, networks, intranets, and extranets; USB; video digitizers; video decoders; video capture cards; HDTV; LCD monitors; large-format printers; DLP projectors; SuperDisk™ and HiFD drives; Zip® and Jaz® drives; flash cards; DVD-ROMs; streaming audio and video; Webcasting; electronic credit; Web publishing; portals; chat rooms; Linux; e-money; e-commerce; telephony; digital subscriber lines; ATM; T-3 lines; cable modems; object-oriented databases; JavaScript; dynamic HTML; XML; distance learning; Web-based training; e-books; secure servers; digital signatures; and much more.

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. Students can step through each Lab exercise in about 15 minutes. Assessment is available. The Interactive Labs are described in detail on page xvi. These Labs are available free on the Web (see page 1.46) or on CD-ROM for an additional cost (ISBN 0-7895-5679-0).



End-of-Chapter Exercises

Unlike other books on the subject of computer fundamentals, a major effort was undertaken in *Discovering Computers 2000* 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:

- **IN BRIEF** This section summarizes the chapter material in the form of questions and answers. Each question addresses a chapter objective, making this section invaluable in 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.
- **KEY TERMS** This list of the key terms found in the chapter together with the page number 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 and a picture, and then click a link to visit a page that offers an alternative explanation.
- **AT THE MOVIES** In this section, students complete exercises that requires them to click photographs on the Web page to view streaming up-to-date CNN videos. These videos, which present computer-related topics, reinforce the chapter or provide extended knowledge of important concepts.
- **CHECKPOINT** Matching 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 answer the questions in an interactive forum.
- **AT ISSUE** 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.
- **HANDS ON** To complete their introduction to computers, students must interact with and use a computer. A series of Windows Lab exercises begins with the simplest exercises within Windows. Students then are led through additional activities that, by the end of the book, will enable them to be proficient in using Windows.

- **NET STUFF** In this section, students gain an appreciation for the World Wide Web by visiting interesting and exciting Web pages and completing suggested tasks. Also included in this section are exercises that have students complete the Shelly Cashman Series Interactive Labs. These Interactive Labs can be done directly from the World Wide Web. The last NET STUFF exercise sends students into a Chat room where they can discuss engaging issues and topics presented in the book with other students throughout the world.

Timeline 2000: Milestones in Computer History

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

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 2.

How Computer Chips Are Made

This special feature following Chapter 3 steps through the intricate details of making a computer chip.

Buyer's Guide 2000: How to Purchase, Install, and Maintain a Personal Computer

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

Careers 2000: Planning, Prerequisites, Potential

This special feature following Chapter 12 provides students with practical information on careers in the computer field and covers preparing for a career in computers, obtaining the necessary foundation, and recognizing the opportunities presented.

Trends 2000: A Look to the Future

Following Chapter 14, a fourteen-page special feature examines several trends that will influence the direction of the computer field. The feature then looks at computers in the future in both the workplace and at home.

INSTRUCTOR'S SUPPORT PACKAGE

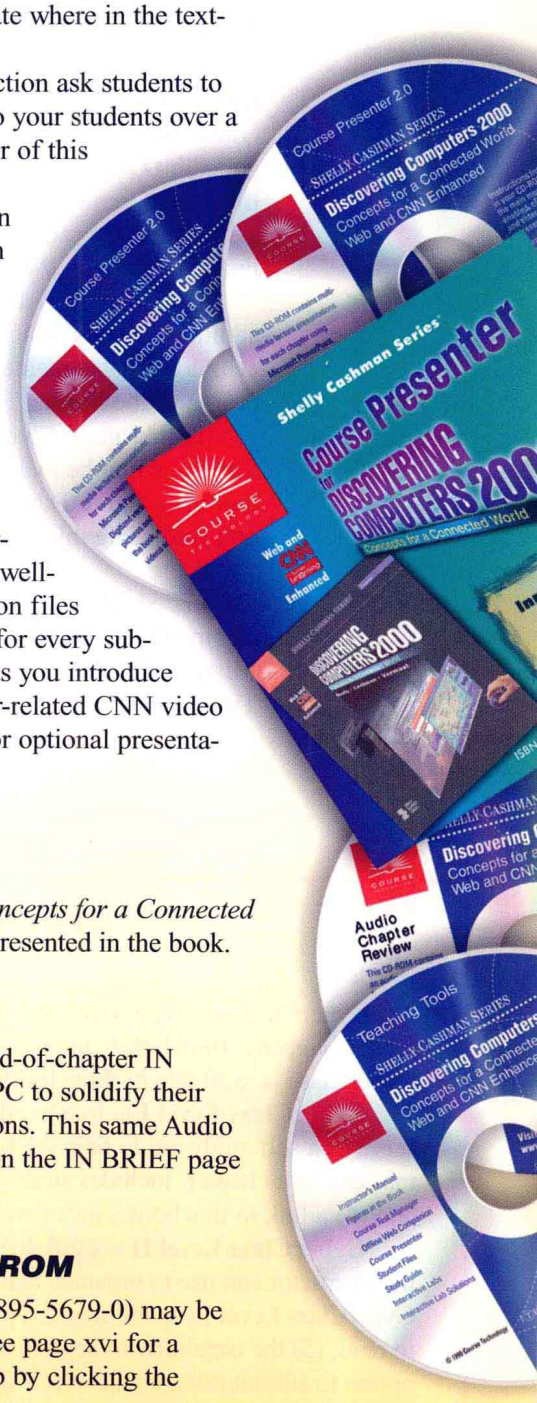
A comprehensive instructor's support package accompanies this textbook in the form of two CD-ROM packages. The two packages titled Teaching Tools (ISBN 0-7895-4620-5) and Course Presenter (ISBN 0-7895-5645-6) are described in the following sections. Both packages are available free to adopters through 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.

Teaching Tools

The Teaching Tools for this textbook include both teaching and testing aids. The contents of the Teaching Tools CD-ROM are listed below.

- **Instructor's Manual** The Instructor's Manual is made up of Microsoft Word files. The 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 exercises; test bank (100 true/false, 50 multiple-choice, and 70 fill-in-the-blank questions per chapter); and figure references. The figures are available in the Figures in the Book ancillary. 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 processing software to generate quizzes and exams from the test bank.

- **Figures in the Book** 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 an effective tool for presenting lectures.
- **Course Test Manager** Course Test Manager is a powerful testing and assessment package that enables instructors to create and print tests quickly 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.
- **Student Files** A few of the exercises in the end-of-chapter HANDS ON section ask students to use these files. You can distribute the files on the Teaching Tools CD-ROM to your students over a network or you can have them follow the instructions on the inside back cover of this book to obtain a copy of the Discover 2000 Data Disk.
- **Interactive Labs** These are the non-audio versions of the eighteen hands-on Interactive Labs exercises. Students can step through each lab in about fifteen minutes to solidify and reinforce computer concepts. Assessment requires students to answer questions about the contents of the Interactive Labs.
- **Interactive Lab Solutions** This ancillary includes the solutions for the Interactive Labs assessment quizzes.



Course Presenter with Figures, Animations, and CNN Video Clips

Course Presenter is a multimedia lecture presentation system 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 introduce the material in class. More than 40 current, two- to three-minute up-to-date, computer-related CNN 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 combination with *Discovering Computers 2000: Concepts for a Connected World, Web and CNN 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 0-7895-5680-4) vocalizes the end-of-chapter IN BRIEF pages (see page 1.38). Students can use this supplement with a CD player or PC to solidify their understanding of the concepts presented. It is a great tool for preparing for examinations. This same Audio Chapter Review also is available at no cost on the Web by clicking the Audio button on the IN BRIEF 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 0-7895-5679-0) 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 button on the NET STUFF exercise pages (see page 1.46).

Study Guide

This highly popular supplement (ISBN 0-7895-4633-7) 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 a guided chapter outline; a self-test consisting of true/false, multiple-choice, short answer, fill-in, and matching questions, an entertaining puzzle, and other challenging exercises.

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 tireless efforts that superior products are produced.

Under Becky's direction, the following individuals made significant contributions to this book: Doug Cowley, production manager; Ginny Harvey, series specialist, developmental editor, and copy editor; Ken Russo, senior graphic designer/Web developer; Mike Bodnar, Stephanie Nance, Mark Norton, and Ellana Russo, graphic artists; Greg Herrington, Web developer; Marlo Mitchem, associate production editor; Jeanne Black, Quark expert; Nancy Lamm and Marilyn Martin, proofreaders; Sarah Evertson of Image Quest, photo researcher; Jeanne Busemeyer, CNN video editor; and Cristina Haley, indexer. Special thanks go to Jim Quasney, series editor, for the tremendous effort he put forth during the development of this book; Lisa Strite, senior editor and developmental editor; Lora Wade, associate product manager; Tonia Grafakos, associate Web product manager; Meagan Walsh, editorial assistant; Scott Wiseman, online developer; Francis Schurgot, Web product manager; and Kathryn Cronin, product marketing manager.

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Gary B. Shelly
Thomas J. Cashman
Misty E. Vermaat
Tim J. Walker

CYBERCLASS — A WEB-BASED TEACHING AND LEARNING SYSTEM

CyberClass is a Web-based teaching and learning system that adopters of *Discovering Computers 2000: Concepts for a Connected World, Web and CNN 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 is free to adopters of this book and includes (1) 25 interactive flash cards per chapter that serve as a self-study aid to help students master chapter content; (2) practice tests that enable students to test their mastery of a chapter; includes study guide feedback; (3) case scenarios that show how corporations use computers; and (4) a link to this book's award-winning Web site.

CyberClass Level II is available for an additional cost and includes (1) a customizable and secure Web site that the instructor can use to organize and administer a campus-based or distance learning-based course; (2) access to all CyberClass Level I capabilities; (3) posting class syllabi for students to read; (4) posting class assignments for students to read; (5) the capability of sending messages to and receiving messages from class members and instructors; (6) an option to submit assignments electronically to instructors; (7) access to a student bulletin board; (8) posting of hot links for class members; (9) electronic flash cards for every bold term in the book, organized by chapter; (10) CyberChallenge, a self-study game; and (11) a class administrative system that includes Web-based testing and class rosters.

CyberClass Level III is available for an additional cost and includes (1) all the capabilities of Level I and Level II; (2) audio-conferencing, which allows instructor and students to meet for Web-based lectures; and (3) 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 the three ways listed below.

1. Throughout the book, marginal annotations called WEB INFO (Figure 1) 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 IN BRIEF, KEY TERMS, AT THE MOVIES, CHECKPOINT, AT ISSUE, CYBERCLASS, HANDS ON, and NET STUFF. These sections 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 instructions at the top of the end-of-chapter pages. When the Web page displays, you can click links or buttons on the page to broaden your understanding of the topics and obtain current information about the topic.
3. Use CyberClass as described on the previous page.

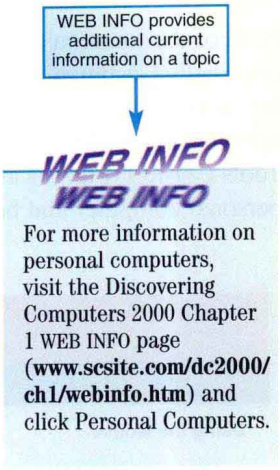

Figure 1

Each time you reference a Web page from *Discovering Computers 2000*, a sidebar displays on the left. To display one of the Student Exercises (Figure 2), click the chapter number and then click the Student Exercise title in the sidebar. To display one of the Special Features, click the desired Special Feature title in the sidebar.

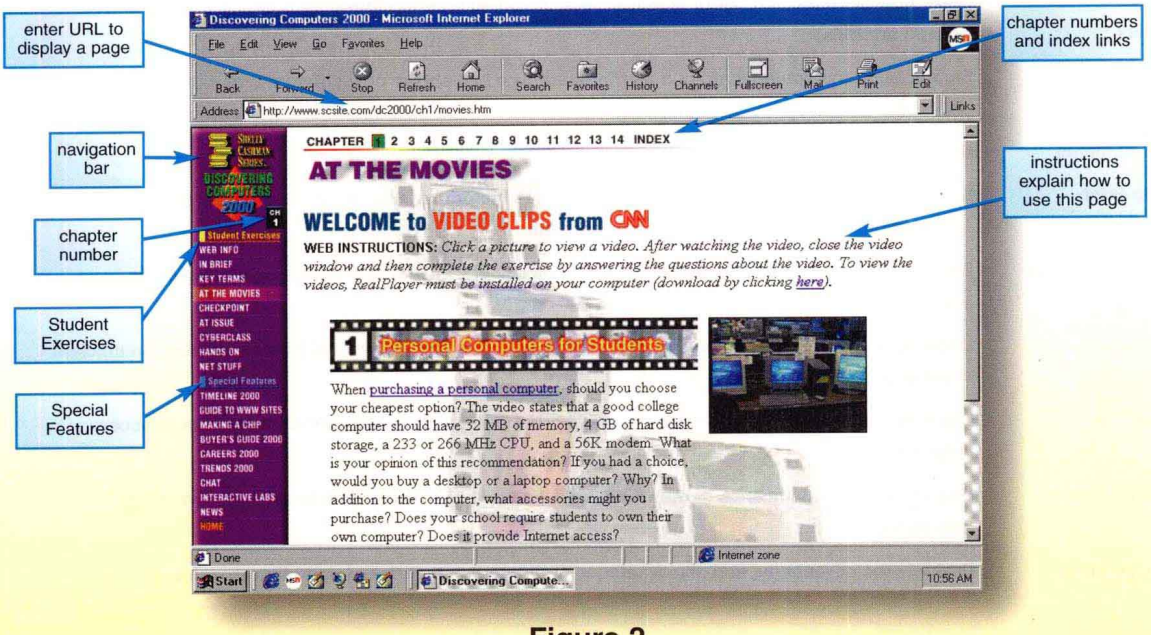

Figure 2

TO DOWNLOAD PLAYERS

For best viewing results of the Web pages referenced in this book, download the Shockwave and Flash Player. To play the audio in the IN BRIEF section and view the video in the AT THE MOVIES section at the end of each chapter, you must download RealPlayer. Follow the steps below:

Shockwave and Flash Player — (1) Launch your browser; (2) enter the URL, `www.macromedia.com`; (3) click shockwave; (4) click the download shockwave and flash button; (5) follow the insructions in the STEP boxes on the Macromedia Web Player Download Center Web page.

RealPlayer — (1) Launch your browser; (2) enter the URL, `www.real.com`; (3) click the FREE RealPlayer G2 button; (4) click RealPlayer G2; (5) click Free RealPlayer with basic features; (6) step through and respond to the forms, requests, and dialog boxes; (7) when the File Download dialog box displays, click Save this program to disk; (8) save the file to a folder and remember the folder name; and (9) launch Explorer and then double-click the downloaded file in step 8.

SHELLY CASHMAN SERIES INTERACTIVE LABS WITH AUDIO

Each of the fourteen chapters in this book includes the NET STUFF exercises, which utilize the World Wide Web. The eighteen Shelly Cashman Series Interactive Labs described below are included as exercises in the NET STUFF section. These Interactive Labs are available on the Web (see page 1.46) or on CD-ROM. The CD-ROM version (ISBN 0-7895-5679-0) is available at an additional cost. A non-audio version is also available at no extra cost on the Shelly Cashman Series Teaching Tools CD-ROM that is available free to adopters. 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.	1.46
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.	1.47
Word Processing	Gain a basic understanding of word processing concepts, from creating a document to printing and saving the final result.	2.55
Working with Spreadsheets	Learn how to create and utilize spreadsheets, including entering formulas, creating graphs, and performing what-if analysis.	2.55
Understanding the Motherboard	Step through the components of a motherboard. The Lab shows how different motherboard configurations affect the overall speed of a computer.	3.40
Scanning Documents	Understand how document scanners work.	4.38
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.	5.36
Configuring Your Display	Recognize the different monitor configurations available, including screen size, display cards, and number of colors.	5.36
Maintaining Your Hard Drive	Understand how files are stored on disk, what causes fragmentation, and how to maintain an efficient hard drive.	6.38
Connecting to the Internet	Learn how a computer is connected to the Internet. The Lab presents using the Internet to access information.	7.44
The World Wide Web	Understand the significance of the World Wide Web and how to use Web browser software and search tools.	7.44
Evaluating Operating Systems	Evaluate the advantages and disadvantages of different categories of operating systems.	8.36
Working at Your Computer	Learn the basic ergonomic principles that prevent back and neck pain, eye strain, and other computer-related physical ailments.	8.36
Exploring the Computers of the Future	Learn about computers of the future and how they will work.	9.44
Designing a Database	Create a database structure and optimize a database to support searching.	10.44
Choosing a Programming Language	Differentiate between traditional languages and the newer object-oriented languages.	12.46
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.	13.40
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.	14.38

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