SHELLY CASHMAN SERIES®

Web Design with HTML5 & CSS3

COMPREHENSIVE

Eighth Edition

MINNICK

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Web Design with HTML5 and CSS3, Comprehensive, Eighth Edition
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Web Design with HTML5 & CSS3

COMPREHENSIVE Eighth Edition

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Preface

The Shelly Cashman Series® offers the finest textbooks in computer education. We are proud that our previous web design and development books have been so well received. With each new edition of our HTML and CSS books, we make significant improvements based on web technology and comments made by instructors and students. For *Web Design with HTML5 and CSS3, Eighth Edition*, the Shelly Cashman Series development team carefully reviewed our pedagogy and analyzed its effectiveness in teaching today's student. Contemporary students read less, but need to retain more. As they develop and perform skills, students must know how to apply the skills to different settings. Today's students need to be continually engaged and challenged to retain what they're learning.

With this web design book, we continue our commitment to focusing on the user and how they learn best.

Objectives of This Textbook

Web Design with HTML5 and CSS3, Eighth Edition, is intended for a first course that offers an introduction to HTML, CSS, and responsive web design techniques. No experience with webpage development or computer programming is required. The objectives of this book are:

- To teach the fundamentals of how to plan and organize the webpages for a new website
- To thoroughly apply two fundamental webpage technologies to realistic case studies: HTML for structure and CSS for style and layout
- To provide an exercise-oriented approach that reinforces learning by doing
- To introduce students to new web technologies and trends, including responsive web design and mobile-first design strategies
- To demonstrate current techniques for incorporating audio and video and for encouraging interactivity through social media and JavaScript
- To promote curiosity and independent exploration of web resources
- To support current, professional webpage development best practices
- To encourage independent study and support distance learners

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The Shelly Cashman Approach

Proven Pedagogy with an Emphasis on Project Planning

Each chapter presents a practical problem to be solved, within a project planning framework. The project orientation is strengthened by the use of the Roadmap, which provides a visual guide for the project. Step-by-step instructions with supporting screens guide students through the steps. Instructional steps are supported by the Q&A, Other Ways, Experimental Steps, and BTW features.

Visually Engaging Book That Maintains Student Interest

The step-by-step tasks with supporting figures create a rich visual experience for the student. Callouts on the screens that present both explanatory and navigational information provide students with information they need when they need to know it.

Supporting Reference Materials (Appendices)

The appendices provide additional information about the details of HTML and CSS so that students can quickly look up information about web design terms, HTML elements, attributes, and valid values as well as CSS properties and values.

End-of-Chapter Student Activities

Extensive end-of-chapter activities provide a variety of reinforcement opportunities for students where they can apply and expand their skills. To complete some of these assignments, you will be required to use the Data Files for Students. Visit www.cengagebrain.com for detailed access instructions or contact your instructor for information about accessing the required files.

New to This Edition

Fresh, Industry-Leading Website Design Practices

For this edition, the development team made a huge leap forward in bringing up-to-date, forward-thinking website development practices into focus and application.

Semantic Wireframe

The webpage development process starts with a semantic wireframe, which uses the structural elements new to HTML5 to efficiently organize the regions of a webpage.

Focus on Responsive Design, Fluid Layouts, and Mobile-First Web Development

Design a single website that responds to the screen displays of desktop and laptop computers, tablets, smartphones, and other mobile devices.

HTML5 and CSS3 Features

The chapter project and exercises incorporate the latest additions to HTML and CSS, including new HTML5 elements, CSS3 properties, and syntax recommended by the World Wide Web Consortium (W3C). Every chapter validates documents using online tools for HTML5 and CSS3.

All New Projects

This edition contains a wealth of contemporary projects that logically build in complexity and probe for understanding. Our goal is not only to help you teach valid HTML and CSS, but to reveal deeper conceptual issues essential to the field of web development. Using the technologies of today's web developers results in websites that are worthy candidates for an electronic portfolio.

Professional Best Practices

With the advent of today's powerful content management systems and website builder tools, do you still need to learn how to create HTML and CSS files from scratch in a text editor? Professionals in the field answer that question with a united, enthusiastic yes! Mastering these technologies is essential to all web-related careers.

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Instructor Resources

The Instructor Resources include both teaching and testing aids and can be accessed via www.cengage.com/login.

Instructor's Manual Includes lecture notes summarizing the chapter sections, figures, and boxed elements found in every chapter, teacher tips, classroom activities, lab activities, and quick quizzes in Microsoft® Word® files.

Syllabus Easily customizable sample syllabus covers policies, assignments, exams, and other course information.

Figure Files Illustrations for every figure in the textbook in electronic form.

PowerPoint Presentations A multimedia lecture presentation system that provides slides for each chapter. Presentations are based on chapter objectives.

Data Files for Students Includes all the files that are required by students to complete the exercises.

Solutions to Exercises Includes solutions for all end-of-chapter exercises and chapter reinforcement exercises.

Test Bank & Test Engine Test banks include questions for every chapter, featuring objective-based and critical thinking question types. Cengage Learning Testing Powered by Cognero is a flexible, online system that allows you to:

- author, edit, and manage test bank content from multiple Cengage Learning solutions
- create multiple test versions in an instant
- deliver tests from your LMS, your classroom, or wherever you want

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Textbook Walk-Through

The Shelly Cashman Series Pedagogy: Project-Based — Step-by-Step — Variety of Assessments

Roadmaps provide a visual guide to each project, showing the students where they are in the process of creating each project.

Step-by-step instructions now provide a context beyond point-and-click. Each step provides information on why students are performing each task, or what will occur as a result.

Q&A boxes anticipate questions students may have when working through the steps and provide additional information about what they are doing right where they need it.

Source: Facebook; source: Twitter

Figure 10–3

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Figure 10–4

Roadmap

In this chapter, you will learn how to create the webpages shown in Figures 10–1, 10–2, 10–3, and 10–4. The following roadmap identifies general activities you will perform as you progress through this chapter:

1. INSERT SOCIAL MEDIA ICONS and LINKS.
2. STYLE SOCIAL MEDIA ICONS.
3. CREATE JAVASCRIPT ALERT MESSAGE.
4. CREATE EXTERNAL JAVASCRIPT FILE.
5. CALL JAVASCRIPT FUNCTIONS.

At the beginning of step instructions throughout the chapter, you will see an abbreviated form of this roadmap. The abbreviated roadmap uses colors to indicate chapter progress: gray means the chapter is beyond that activity, blue means the task being shown is covered in that activity, and black means that activity is yet to be covered. For example, the following abbreviated roadmap indicates the chapter would be showing a task in the 2 STYLE SOCIAL MEDIA ICONS activity.

2

- Save your changes and refresh classes.html in your browser (Figure 8–23).

Q&A Why does the border appear only around the sides of the table?
The style rule you created applies to the table only. You will style the `th` and `td` elements in subsequent steps.

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Figure 8–23

3

- In the styles.css file, tap or click at the end of Line 276, if necessary, and then press the ENTER key twice to insert new Lines 277 and 278.
- On Line 278, type `/* Style specifies border and padding for th and td elements */` to insert a new comment.
- Press the ENTER key to insert a new Line 279, and then type `th, td {` to insert a new selector.
- Press the ENTER key to insert a new Line 280, increase the indent, and then type `border: 0.1em solid #000000;` to insert a new property and value.
- Press the ENTER key to insert a new Line 281, and then type `padding: 1em;` to insert a new property and value.
- Press the ENTER key to insert a new Line 282, decrease the indent, and then type `}` to insert a closing brace (Figure 8–24).

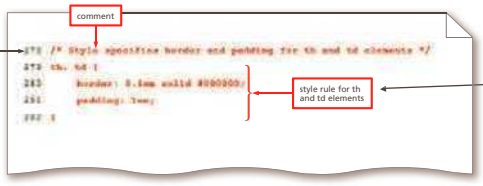

Figure 8–24

Q&A What is the result of the new style?
The style applies a thin (0.1em) solid black (#000000) border and 1em of padding to all sides of the table header and the table data elements.

Explanatory callouts summarize what is happening on screen.

Navigational callouts in red show students where to tap or click.

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Experiment Steps within the step-by-step instructions encourage students to explore, experiment, and take advantage of web technologies. These steps are not necessary to complete the projects, but are designed to increase confidence and problem-solving skills.

2

- Press the ENTER key to insert a new Line 71, and then type `<source src="media/ffc_aud.ogg" type="audio/ogg">` to insert a source element.

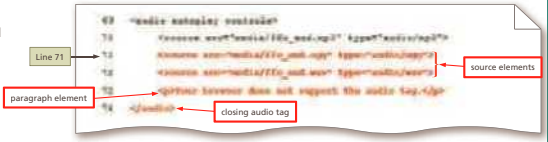

Figure 9–14

- Press the ENTER key to insert a new Line 72, and then type `<source src=" media/ffc_aud.wav" type="audio/wav">` to insert a source element.
- Press the ENTER key to insert a new Line 73, and then type `<p>Your browser does not support the audio tag.</p>` to insert a paragraph element.
- Press the ENTER key to insert a new Line 74, decrease the indent, and then type `</audio>` to insert a closing audio tag (Figure 9–14).

Q&A

Why do I need to include three source elements?
To accommodate all major browsers, you specify three audio source files, MP3, Ogg, and WAV. These are the three file formats supported by the audio element.

Will the webpage display the paragraph element?
The webpage displays the paragraph element only if the browser does not support the `audio` element.

3

- Save your change, open index.html in your browser, adjust the window to the size of a desktop viewport, and then scroll down to view the audio controls (Figure 9–15).

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Figure 9–15

Experiment

- The loop attribute automatically replays the audio file after it is finished. To see how this works, add the loop attribute to the audio tag, save your changes, and then refresh index.html in your browser.
- Remove the controls attribute from the audio element to view the page without controls, save your changes, and then refresh index.html in your browser.
- Remove the loop attribute, add the controls attribute to the audio tag, and then save your changes.

Q&A

A message appears at the bottom of my window, "Internet Explorer restricted this webpage from running scripts or ActiveX controls." How should I proceed?
Tap or click the Allow blocked content button to play the audio file and display the audio controls.

My controls do not look like the controls in Figure 9–15. Why?
Figure 9–15 shows the controls in Internet Explorer 11. If you are using a different browser, your controls will look different.

Break Point: If you want to take a break, this is a good place to do so. You can exit the text editor now. To resume at a later time, run your text editor, open the file called about.html, and continue following the steps from this location forward.

CONSIDER THIS

Can I redesign a desktop-only website for multiplatform displa
Yes. If your audience is accustomed to the desktop-only website, retrofitting
makes sense because the site remains familiar to users. You also avoid buildi
vantage of design decisions such as color scheme and use media you have al
content and number of pages, redesigning may be a time-consuming proces

Wireframe

Before web designers actually start cre
they sketch the design using a wireframe. A w
clearly identifies the location of main webpag
organization logo, content areas, and images.
your webpages, use lines and boxes as shown
plenty of white space within your design to i
distinguish among the areas on the webpage.
active white space and passive white space. A
that is intentionally left blank. Typically, the
the design of an asymmetrical page. **Passive**
areas. Passive white space helps a user focus on one part of the page. Proper use of white space makes webpage content easy to read and brings focus to page elements.

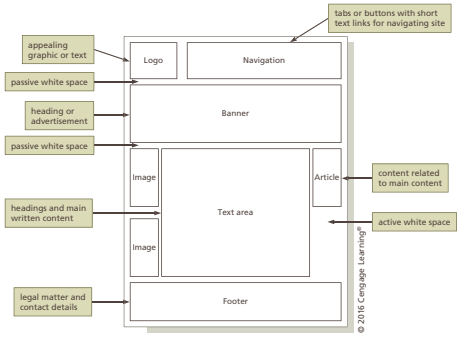

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Figure 1–12

Site Map

A **site map** is a planning tool that lists or displays all the pages on a website and indicates how they are related to each other. In other words, a site map shows the structure of a website. Begin defining the structure of a website by identifying the information to provide and then organize that information into divisions using the organizing method that makes the most sense for the content. For example, if the website offers three types of products for sale, organize the site by product category. If the website provides training, organize the site in a step-by-step sequence.

Next, arrange the webpages according to a logical structure. A website can use several types of structures, including linear, hierarchical, and webbed. Each structure connects the webpages in a different way to define how users navigate the site and view

Consider This boxes pose thought-provoking questions with answers throughout each chapter, promoting critical thought along with immediate feedback.

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Textbook Walk-Through

Chapter Summary lists the tasks completed in the chapter, grouped into major task categories in an outline format.

Apply Your Knowledge exercise usually requires students to open and manipulate a file to practice the activities learned in the chapter.

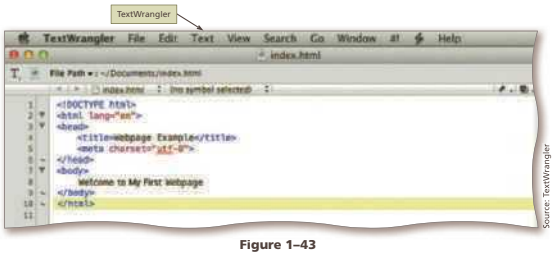

Figure 1–43

Chapter Summary

In this chapter, you learned about the Internet, the web, and associated technologies, including web servers and web browsers. You learned the essential role of HTML in creating webpages and reviewed tools used to create HTML documents. You also learned how to create a basic HTML webpage. The items listed below include all the new concepts and skills you have learned in this chapter, with the tasks grouped by activity.

Creating a Basic Webpage
- Start Notepad++ and Create a Blank Document (HTML 30)
- Add Basic HTML Tags to a Document (HTML 31)
- Add a Title and Text to a Webpage (HTML 32)
- Save a Webpage (HTML 33)
- View a Webpage in a Browser (HTML 34)

Exploring the Internet
- Describe the Internet (HTML 3)
- Describe the World Wide Web (HTML 4)
- Define Protocols (HTML 6)
- Discuss Web Browsers (HTML 7)
- Identify Types of Websites (HTML 9)

Planning a Website
- Identify the Purpose and Audience of the Website (HTML 11–12)
- Design for Multiplatform Display (HTML 13)
- Describe a Wireframe and a Site Map (HTML 14)
- Consider Graphics, Navigation, Typography, and Color (HTML 17–19)
- Design for Accessibility (HTML 20)

Understanding the Basics of HTML
- Define Hypertext Markup Language (HTML 21)
- Describe HTML Elements (HTML 21)
- List Useful HTML Practices (HTML 22)
- Identify Technologies Related to HTML (HTML 23)
- Explain the Role of Other Web Programming Languages (HTML 23)

Using Web Authoring Tools
- Identify Text Editors (HTML 24)
- Download and Install a Text Editor (HTML 27)
- Describe WYSIWYG Editors (HTML 27)

What decisions will you need to make when creating your next webpage?
Use these guidelines as you complete the assignments in this chapter and create your own webpages outside of this class.

CONSIDER THIS

1. Plan the website.
   a. Identify the purpose of the website.
   b. Identify the users of the website.
   c. Recognize the computing environments of the users.
   d. Design a wireframe and a site map.
2. Choose the design components.
   a. Identify possible graphics for the website.
   b. Determine the types of navigation tools and typography to use.
   c. Select a color scheme.
   d. Consider accessibility.

Continued >

How should you submit solutions to questions in the assignmen
Every assignment in this book contains one or more questions identified wit
require you to think beyond the assigned presentation. Present your solutio
required by your instructor. Possible formats may include one or more of the
contains the answer; present your answer to the class; discuss your answer
dio or video using a webcam, smartphone, or portable media player; or pos

Apply Your Knowledge

Reinforce the skills and apply the concepts you learned in

Styling for Responsive Design

Instructions: In this exercise, you will use your text editor to ap
responsive design principles to an existing webpage. You will m
images flexible, change the layout to a fluid layout, and add a vi
meta tag. The completed webpage is shown in Figure 5–55. Yo
also use professional web development practices to indent, spac
comment, and validate your code.

Perform the following tasks:

1. Open apply05.html in your browser to view the webpage. Adjust the browser window to view the fixed layout.
2. Open apply05.html in your text editor and modify the comment at the top of the page to include your name and today's date.
3. Remove the width and height attributes from the image elements and save your changes.
4. Open the styles05.css file from the apply\css folder. Modify the comment at the top of the styles05.css page to include your name and today's date.
5. In the styles05.css file, add a max-width property with a value of 100% to the img selector.
6. Locate the #container selector and change the width value to use a relative measurement and take up the full width of the page.
7. Save the styles05.css file and refresh the apply05.html file in your browser. Resize the browser to make sure that a fluid layout has been applied and that the images are flexible.
8. In apply05.html, add the following meta tag within the head section of the document:
   `<meta name="viewport" content="width=device-width, initial-scale=1">`
9. Save your changes to apply05.html and open the file in Google Chrome.
10. Use the developer tools in Google Chrome to view the page in an emulator.
11. Select a device and refresh the page. The page should look similar to Figure 5–55.
12. Validate your HTML document using the W3C validator found at validator.w3.org and fix any errors that are identified.
13. Validate your CSS file using the W3C validator found at http://jigsaw.w3.org/css-validator/ and fix any errors that are identified.
14. Submit the apply05.html and styles05.css files in a format specified by your instructor. Your instructor may also ask you to submit the images folder used with apply05.html.
15. In step 5, you changed the value to use a percentage (%) measurement. Explain how the percentage unit of measurement makes a fluid layout more flexible as compared to px.

Figure 5–55

Consider This: Plan Ahead box presents a single master planning guide that students can use as they create webpages on their own.

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STUDENT ASSIGNMENTS

Extend Your Knowledge

Extend the skills you learned in this chapter and experiment with new skills. You may need to use additional resources to complete the assignment.

Learning More About Google Webmaster Guidelines

Instructions: In this exercise, you research information about Google webmaster guidelines and summarize your findings.

Perform the following tasks:

1. Use your browser to search for Google Webmaster Guidelines.
2. Read the information and use your word processor to summarize your findings.
3. Include the following information in your response.
   a. Identify at least three design guidelines.
   b. Identify at least three technical guidelines.
   c. Identify at least five things to avoid.
4. Name your file `extend_11` and submit it in a format specified by your instructor.
5. In this exercise, you learned more about Google webmaster guidelines. Research Bing webmaster guidelines and identify three of its guidelines that coincide with the Google guidelines.

Analyze, Correct, Improve

Analyze a website, correct all errors, and improve it.

Improving SEO for a Webpage

Instructions: Work with the analyze11.html file in the analyze folder and the analyze11styles.css file from analyze/css folder from the Data Files for Students. The analyze11.html webpage needs a page title, a meta description, and an h1 tag. The alt text on the page also needs to be improved. Use Figure 11–24 as a guide to correct these files.

Figure 11–24

Extend Your Knowledge projects at the end of each chapter allow students to extend and expand on the skills learned within the chapter. Students use critical thinking to experiment with new skills to complete each project.

Analyze, Correct, Improve projects call on students to analyze a file, discover errors in it, fix the errors, and then improve the file using the skills they learned in the chapter.

STUDENT ASSIGNMENTS HTML Chapter 5

Analyze, Correct, Improve

Analyze an external style sheet, correct all errors, and improve it.

Changing a Nonresponsive Page into a Responsive Page

Instructions: Work with the responsive05.html file in the analyze folder and the responsivestyles05.css file in the analyze\css folder from the Data Files for Students. Several responsive web design resources are listed on the responsive05 webpage, but the HTML document and the style sheet are not coded for responsive design as shown in Figure 5–57. Use Figure 5–58 as a guide to correct these files. You will also use professional web development best practices to comment, indent, space, and validate your work.

Figure 5–57

Figure 5–58

1. Correct

a. Open the responsive05.html file in your editor from the Data Files for Students and then modify the comment at the top of the page to include your name and today's date.

b. Open the responsivestyles05.css file in your editor from the Data Files for Students and then modify and correct the comment at the top of the document to include your name and today's date.

c. View responsive05.html in your browser and resize the page to recreate the problems with a nonresponsive webpage as shown in Figure 5–56. The content and images are cut off as the browser width decreases.

d. In the responsive05.html file, add the viewport meta tag right above the closing </head> tag:

```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

Continued >

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Textbook Walk-Through

STUDENT ASSIGNMENTS

In the Labs

Labs 1 and 2, which increase in difficulty, require you to create webpages based on what you learned in the chapter; Lab 3 requires you to dive deeper into a topic covered in the chapter.

Lab 1: Adding Video to the New Harvest Food Bank Website

Problem: You volunteer at a local food bank called New Harvest Food Bank that collects community food donations and provides food and other services to those in need. You have already created a responsive website but now need to add a video to the home page to attract volunteers. You also need to format the video on the page. Create and style the video as shown in Figure 9–27.

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Figure 9–27

In the Lab Three in-depth assignments in each chapter require students to apply the chapter concepts and techniques to solve problems. One Lab is devoted to special topics in web development.

llowing tasks:

folder from the Data Files for Students to your lab1 folder.

r and then open the index.html document in the lab1 folder and update top of the page to include today's date.

ent of the index.html document, insert a `video` element with `ntrols` attributes.

three source files within the `video` element and insert the appropriate value for each source.

```
nteer.mp4"
nteer.ogg"
nteer.webm"
```

lement below the source elements with text that states `Your browser t the video element.`

ent in a `div` element and include a `class="video"` attribute and

STUDENT ASSIGNMENTS HTML Chapter 1

3. Using the web server documentation provided by your instructor or school, fill out the right column of the table to identify the pieces of information needed to publish your webpages. A sample solution is provided in webpublishing.docx that applies to students at Johnson County Community College in Overland Park, Kansas.
4. Use the web to research three inexpensive web server alternatives.
5. Open the webserveralternatives.docx document from the Data Files for Students.
6. Using the information you found in Step 4, complete the table in the webserveralternatives.docx document to compare three web server alternatives. You may be asked to share and compare this information with the rest of the class.
7. Confirm if and how your instructor wants you to publish your webpages, as well as how your work will be submitted for grading purposes.
8. Some web hosting companies offer *free* web hosting services. However, all businesses need to generate revenue in order to survive. Using your favorite search engine, identify three ways *free* web hosting companies generate revenue.

Consider This: Your Turn

Apply your creative thinking and problem-solving skills to design and implement a solution.

Note: To complete this assignment, you will be required to use the Data Files for Students. Visit www.cengage.com/ct/studentdownload for detailed instructions or contact your instructor for information about accessing the required files.

1. Design and Create a Personal Portfolio Website

Personal

Part 1: As in almost every field, the job market for the best jobs in web development are competitive. One way to give yourself a big edge in a job search is to create an appropriate personal portfolio website to showcase your skills. Plan the website by completing the table in the portfolio.docx document in the Data Files for Students. Answer the questions with thoughtful, realistic responses. Be sure to sketch the wireframe for your home page on the last page. Submit your assignment in the format specified by your instructor.

Part 2: What do you want this website to accomplish?

2. Design and Create a Website for a Web Development and Consulting Business

Professional

Part 1: When you are finished with college, you plan to join a web development and consulting firm to gain experience in the field. Your long-term goal is to start and own a web development and consulting firm. You decide to begin by designing a website you would eventually like to build for the firm. Start planning the website by completing the table in the webdevelopment.docx document in the Data Files for Students. Answer the questions with thoughtful, realistic responses. Be sure to sketch the wireframe for your home page on the last page. Submit your assignment in the format specified by your instructor.

Part 2: What are some general characteristics of any successful small business that you want this website to portray? What are some characteristics of a successful web development consulting firm that you want this website to portray?

Continued >

Consider This: Your Turn exercises call on students to apply creative-thinking and problem-solving skills to design and implement a solution.

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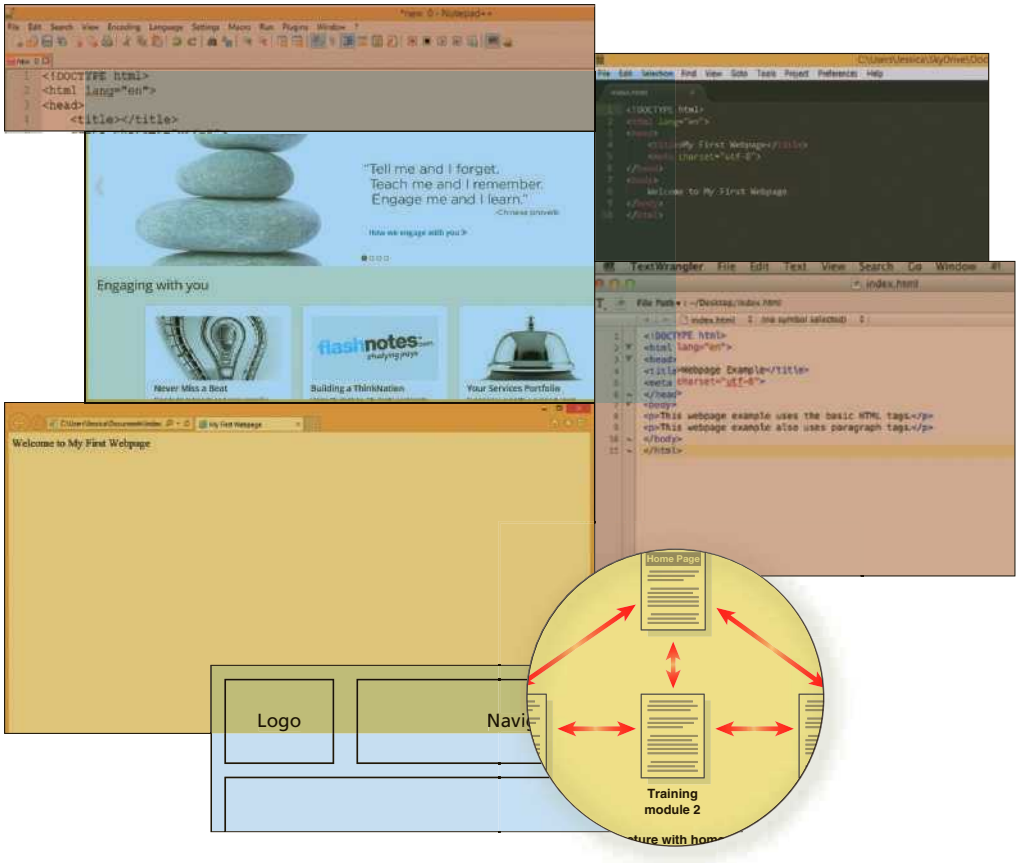
1 Introduction to the Internet and Web Design



Objectives

You will have mastered the material in this chapter when you can:

- Define the Internet and associated key terms
- Recognize Internet protocols
- Discuss web browsers and identify their main features
- Describe the types and purposes of websites
- Plan a website for a target audience
- Define a wireframe and a site map
- Explain how websites use graphics, navigation tools, typography, and color
- Design for accessibility and multiplatform display
- Define Hypertext Markup Language (HTML) and HTML elements
- Recognize HTML versions and web programming languages
- Identify web authoring tools
- Download and use a web authoring tool
- Create and view a basic HTML webpage

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1 Introduction to the Internet and Web Design

Introduction

Today, millions of people worldwide have access to the Internet, the world's largest network. Billions of webpages providing information on any subject you can imagine are currently available on the web. People use the Internet to search for information, to communicate with others around the world, and to seek entertainment. Students use the Internet to register for classes, pay tuition, and find out final grades. Businesses and other organizations rely on the Internet and the web to sell products and services. Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS) are two of the technologies that make this possible.

The most recent version of HTML is called HTML5. Before exploring the details of creating webpages with HTML5 and CSS, it is useful to look at how these technologies relate to the development of the Internet and the web. In this chapter, you learn some basics about the Internet and the web, and the rules both follow to allow computers to communicate with each other. You review types of websites and learn how to properly plan a website so that it is appealing and useful to your target audience. You also explore web browsers, HTML, and its associated key terms. Lastly, you create a basic webpage using a text editor.

Project — Create a Basic Webpage

People and organizations create webpages to attract attention to information such as products, services, multimedia, news, and research. Although webpages display content including text, drawings, photos, animations, videos, and links to other webpages, they are created as documents containing only text.

The project in this chapter follows general guidelines and uses a text editor to create the webpage shown in Figure 1–1. Figure 1–1a shows the **code**, meaningful combinations of text and symbols that a web browser interprets to display the webpage shown in Figure 1–1b. The content includes two lines of text. Other parts of the code indicate that one line of text should be displayed as the webpage title, which appears in the browser on a webpage tab. Code also specifies that the other line of text should appear as a paragraph of body text.

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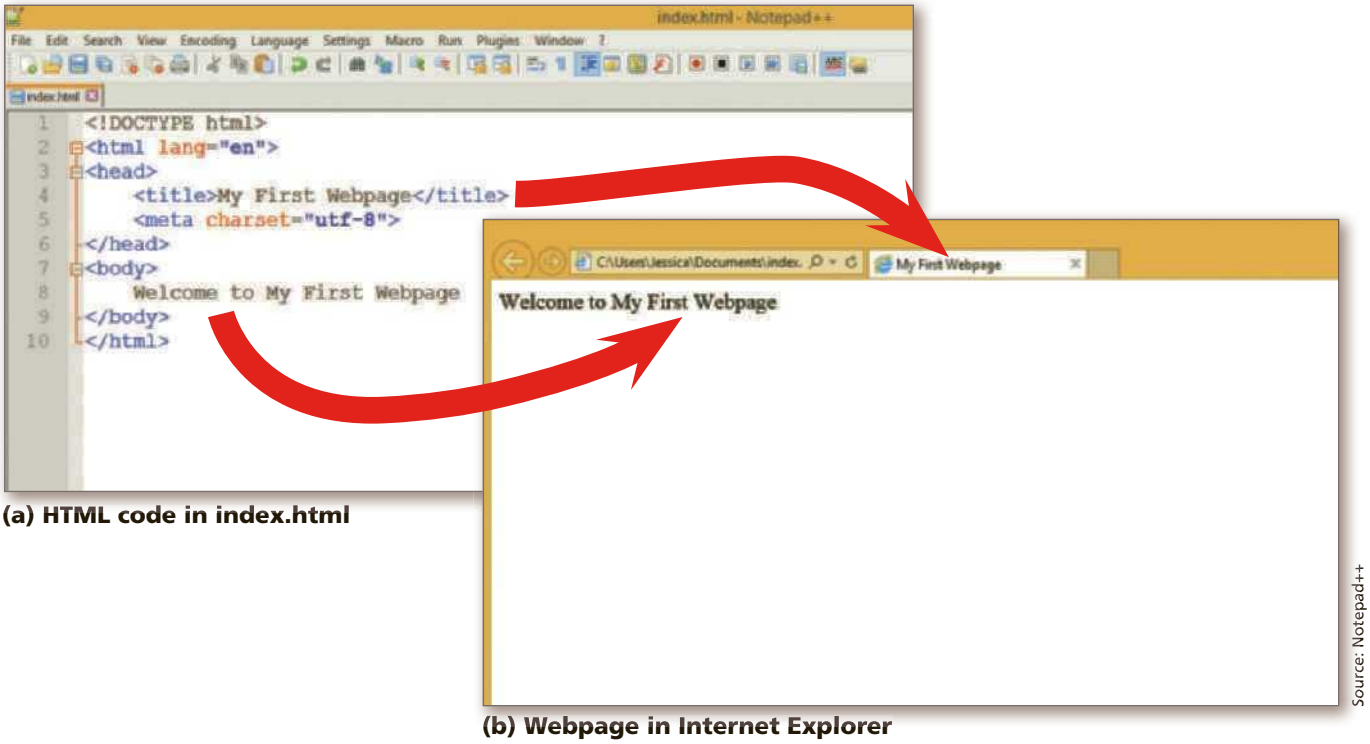

(a) HTML code in index.html

(b) Webpage in Internet Explorer

Figure 1–1

Roadmap

In this chapter, you learn how to create the webpage shown in Figure 1–1. The following roadmap identifies general activities you perform as you progress through this chapter:

1. RUN a TEXT EDITOR and CREATE a BLANK DOCUMENT.
2. ENTER HTML TAGS in the document.
3. ADD TEXT to the webpage.
4. SAVE the WEBPAGE as an HTML document.
5. VIEW the WEBPAGE in a browser.

At the beginning of step instructions throughout the chapter, you see an abbreviated form of this roadmap. The abbreviated roadmap uses colors to indicate chapter progress: gray means the chapter is beyond that activity; blue means the task being shown is covered in that activity; and black means that activity is yet to be covered. For example, the following abbreviated roadmap indicates the chapter would be showing a task in the 4 SAVE WEBPAGE activity.

1 RUN TEXT EDITOR & CREATE BLANK DOCUMENT | 2 ENTER HTML TAGS
3 ADD TEXT | 4 SAVE WEBPAGE | 5 VIEW WEBPAGE

Use the abbreviated roadmap as a progress guide while you read or step through the instructions in this chapter.

Exploring the Internet

Every day, millions of people use a computer to connect to the Internet. The **Internet** is a worldwide collection of computers linked together for use by businesses, governments, educational institutions, other organizations, and individuals using

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modems, phone lines, television cables, satellite links, fiber-optic connections, radio waves, and other communications devices and media (Figure 1–2).

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Figure 1–2

The Internet was developed in the 1960s by the Department of Defense Advanced Research Projects Agency (ARPA). ARPANET (as the Internet was originally called) had only four nodes and sent its first message in 1969. A **node** is any device, such as a computer, tablet, or smartphone, connected to a **network**, which is a collection of two or more computers linked together to share resources and information. The Internet has billions of nodes on millions of networks. The **Internet of Things** is a term used to describe the ever-growing number of devices connecting to a network, including televisions and appliances. Today, high-, medium-, and low-speed data lines connect networks. These **data lines** allow data (including text, graphical images, audio, and video) to move from one computer to another. The **Internet backbone** is a collection of high-speed data lines that link major computer systems located around the world. An **Internet service provider (ISP)** is a company that has a permanent connection to the Internet backbone. ISPs use high- or medium-speed data lines to allow personal and business computer users to connect to the backbone for access to the Internet. A home Internet connection is generally provided through a cable or fiber-optic line that connects to an ISP.

Billions of people in most countries around the world connect to the Internet using computers in their homes, offices, schools, and public locations such as libraries. In fact, the Internet was designed to be a place in which people could share information and collaborate. Users with computers connected to the Internet can access a variety of popular services, including email, social networking, and the web.

World Wide Web

Many people use the terms Internet and World Wide Web interchangeably, but these terms have different meanings. The Internet is the infrastructure, or the physical networks of computers. The **World Wide Web**, also called the **web**, is the service that provides access to information stored on web servers, the high-capacity, high-performance

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computers that power the web. The web consists of a collection of linked files known as **webpages**, or pages for short. Because the web supports text, graphics, audio, and video, a webpage can display any of these multimedia elements in a browser.

A **website**, or site for short, is a related collection of webpages created and maintained by a person, company, educational institution, or other organization, such as the U.S. Department of Education (Figure 1–3). Each website contains a **home page**, which is the main page and the first document users see when they access the website. The home page typically provides information about the website's purpose and content, often by including a list of links to other webpages on the website.

Figure 1–3

Hyperlinks are an essential part of the web. A **hyperlink**, more commonly called a **link**, is an element that connects one webpage to another webpage on the same server or to any other web server in the world. Tapping or clicking a link allows you to move quickly from one webpage to another without being concerned about where the webpages reside. You can also tap or click links to move to a different section of the same webpage.

With hyperlinks, you do not necessarily have to view information in a linear way. Instead, you can tap or click the available links to view the information in a variety of ways, as described later in this chapter. Many webpage components, including text, graphics, and animations, can serve as links. Figure 1–4 shows examples of several webpage components used as hyperlinks.

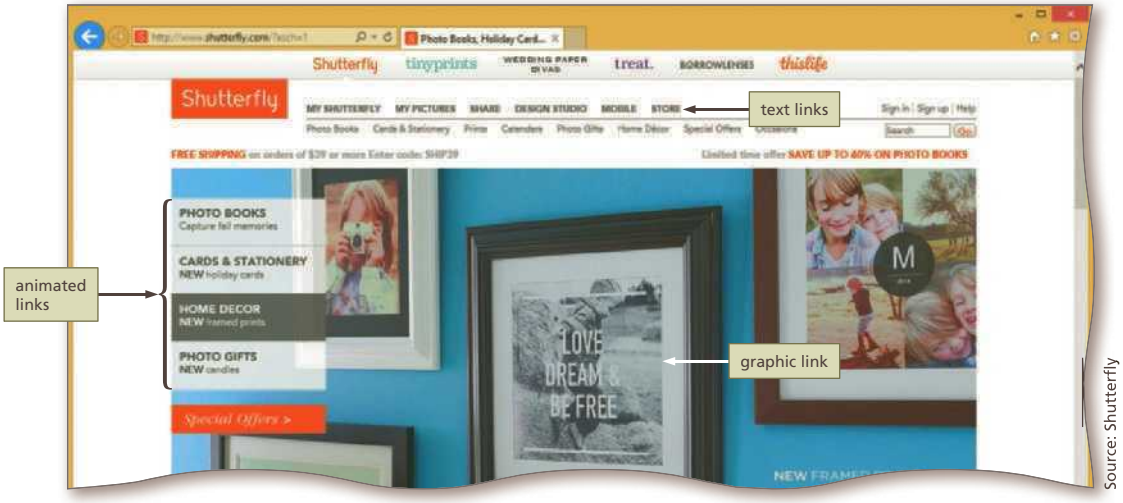

Figure 1–4

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Protocols

A computer is also referred to as a client workstation. Client workstations connect to the Internet through the use of a protocol. A **protocol** is a set of rules that defines how a client workstation can communicate with a server. A client workstation uses a protocol to request a connection to a server. The **server** is the host computer that stores resources and files for websites (Figure 1–5).

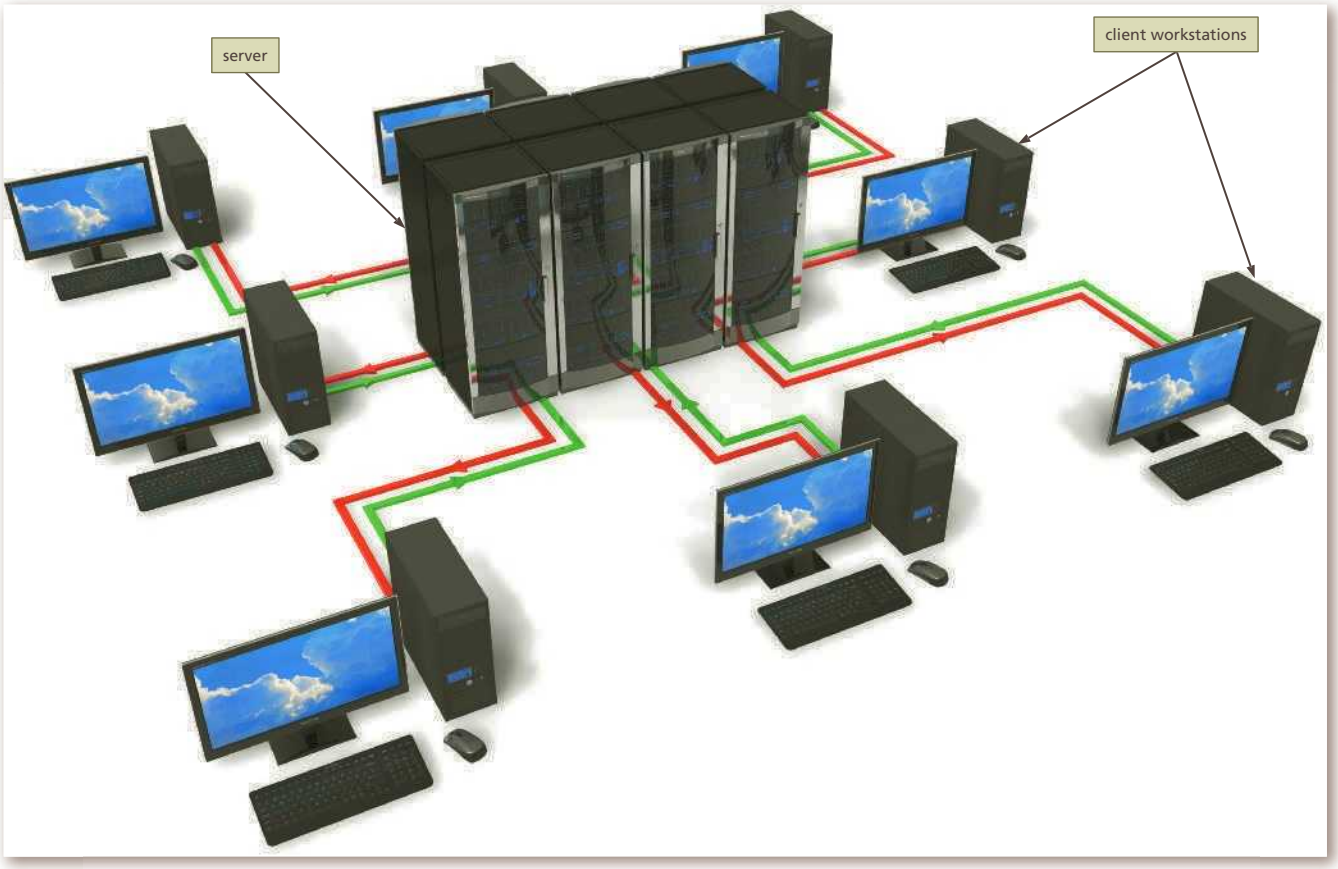

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Figure 1–5

Hypertext Transfer Protocol (HTTP) is the fundamental protocol used on the web to exchange and transfer webpages. HTTP is a set of rules for exchanging text, graphics, audio, video, and other multimedia files on the web. When you tap or click a link on a webpage, your computer uses HTTP to connect to the server containing the page you want to view, and then to request and display the appropriate page.

File Transfer Protocol (FTP) is used to exchange files from one computer to another over the Internet (not the web). The sole purpose of FTP is to exchange files; this protocol does not provide a way to view a webpage. Businesses commonly use FTP to exchange files with vendors and suppliers. Web designers often use FTP to transfer updated website content to a web hosting server, the computer that stores webpages and other related content for a website.

Transmission Control Protocol/Internet Protocol (TCP/IP) is a pair of protocols used to transfer data efficiently over the Internet by properly routing it to its destination. TCP oversees the network connection between the data source and destination and micromanages the data. When data is sent over the Internet, TCP breaks the data into packets. Each packet contains addressing information, which the IP manages. One way to better understand TCP/IP is through an analogy of the postal system. The tasks TCP performs are similar to those workers or machines perform

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when handling a bundle of packages in a post office. In this analogy, the packages are addressed to one destination, but are too large to send as a single bundle. TCP breaks up the bundle into manageable pieces and then sends them out for delivery. When each piece arrives at the destination, TCP reassembles the bundle of packages.

Internet Protocol (IP) ensures data is sent to the correct location. In the postal system analogy, the IP part of TCP/IP refers to the street address and zip code to route a piece of mail. Just as people have a unique mailing address, every client workstation and server on the Internet has a unique IP address. An example of an IP address is 192.168.1.5. Every website has a unique IP address, which makes it easy for computers to find websites. However, most people have difficulty remembering and using IP addresses to access websites. The **Domain Name System (DNS)** was created to resolve this issue. The DNS associates an IP address with a domain name. For example, the DNS associates the IP address 204.79.197.200 with the domain name bing.com.

Web Browsers

To access a website and display a webpage, a computer, tablet, or mobile device must have a web browser. A **web browser**, also called a **browser**, is a program that interprets and displays webpages so you can view and interact with them. Computing devices such as smartphones, tablets, laptops, and desktops include their own default browser, but you also have the option to download and use the browser of your choice. Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Apple Safari, and Opera (Figure 1–6) are popular browsers. You use a browser to locate websites, to link from one webpage to another, to add a favorite or bookmark a webpage, and to choose security settings.

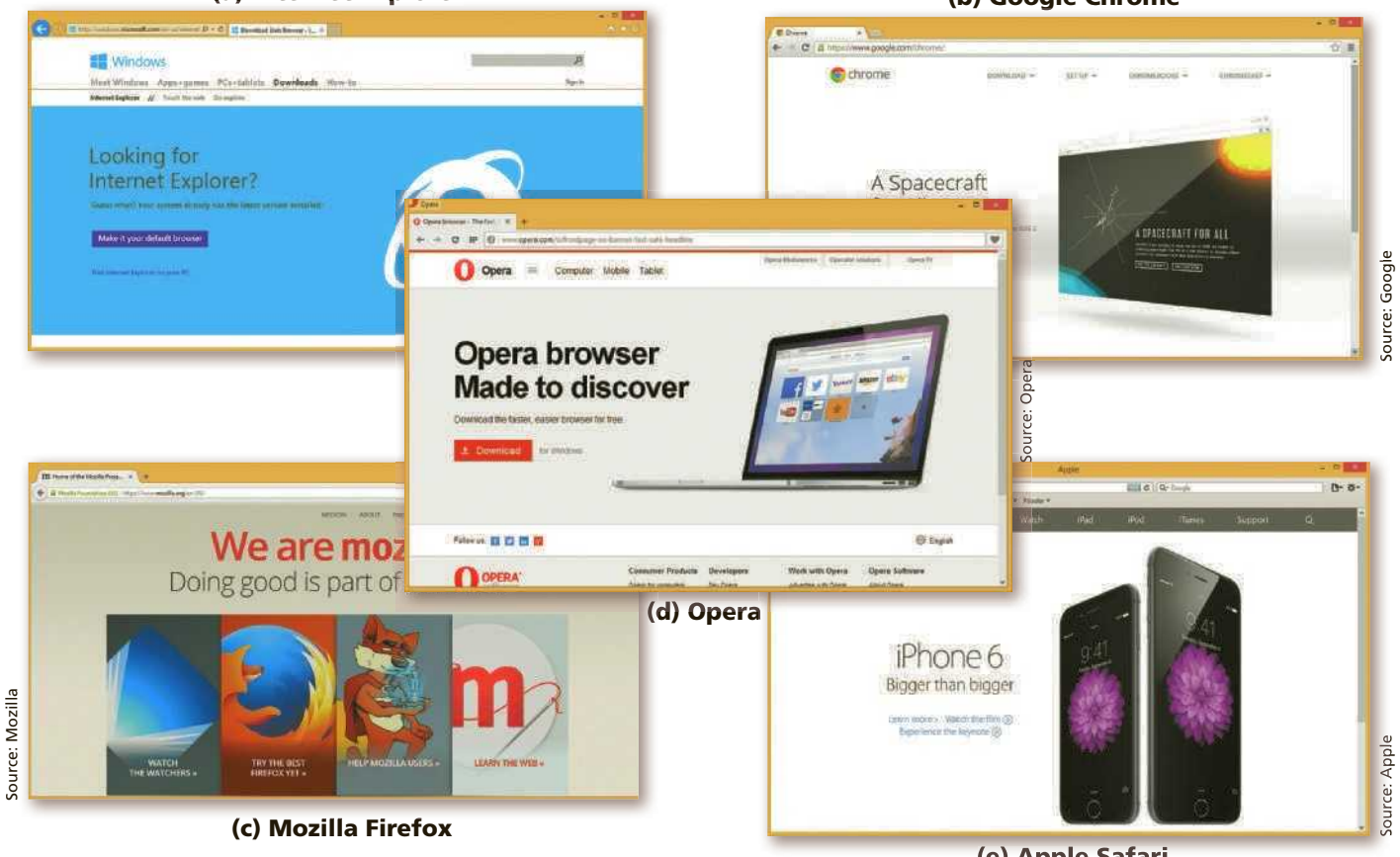

Figure 1–6

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Besides varying by publisher, browsers vary by version. Most browsers do not display webpages identically. In fact, older versions of some browsers do not support the most recent HTML5 standards. As you are designing your website, you must view it using various browsers to ensure that it looks and functions as you intended.

Internet Explorer (Figure 1-7) is the default browser provided with the Windows 8.1 operating system and provides tools for visiting webpages and an array of options to customize settings. As with all browsers, you can use Internet Explorer to enter a website address in the address bar to display a particular webpage, designate a specific webpage or set of webpage tabs to display when you run the browser, and bookmark frequently visited websites as favorites for easy access. Important features of Internet Explorer are summarized in Table 1–1.

Figure 1–7

Table 1–1 Features of Internet Explorer 11

Feature	Description
Address bar	Displays the website address of the webpage you are viewing
Webpage tab	Displays the title of the webpage; you can open multiple tabs to view multiple webpages
Home button	Opens the browser's designated home page or default webpage, which can be customized on the General tab of the Internet Options dialog box
Favorites button	Allows you to save and view your favorite webpages
Tools button	Provides access to print, zoom, and safety features and lets you view downloads and manage add-ons
Document window	Displays the current webpage content

CONSIDER THIS

What is the difference between a website's home page and a web browser's home page?
A website's home page is the default page displayed when you enter a web address such as www.cengage.com into the address bar of a browser. As mentioned earlier, this type of home page is the introductory page of a website and provides links to access other parts of the site. A browser also has a home page, which appears when you open a browser or tap or click the Home button in the browser window. You can specify any webpage as the default home page of a browser.

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A web address, or **Uniform Resource Locator (URL)**, is the address of a document or other file accessible on the Internet and identifies the network location of a website, such as www.bing.com. To access a website using a browser, you type the webpage's URL in the browser's address bar (Figure 1–8).

Figure 1–8

The URL in Figure 1–8 indicates to the browser to use the HTTP communications protocol to locate the index.html webpage in the shop folder on the cengagebrain.com server or domain. A **domain** is an area of the Internet a particular organization or person manages. In this case, cengagebrain.com is the name of the domain, with the .com indicating it is registered as a commercial enterprise. The www part of the URL is short for World Wide Web and is a common subdomain used in a URL. The www is not required and can be omitted or replaced with another meaningful name for the subdomain. You can find webpage URLs in a wide range of places, including school catalogs, business cards, product packaging, and advertisements.

CONSIDER THIS

How do you use a subdomain within a URL?

A subdomain further identifies an area of content. For example, the URL support.microsoft.com indicates that support is a subdomain name used in the microsoft.com domain or server. This subdomain contains helpful information to support Microsoft products.

Types of Websites

An **Internet site** is another term for a website that is generally available to anyone with an Internet connection. Other types of websites include intranets and extranets, which also use Internet technology, but limit access to specified groups. An **intranet** is a private network that uses Internet technologies to share company information among employees. An intranet is contained within an organization's network, which makes it private and available only to those who need access. Organizations often distribute documents such as policy and procedure manuals, employee directories, company newsletters, product catalogs, and training manuals on an intranet.

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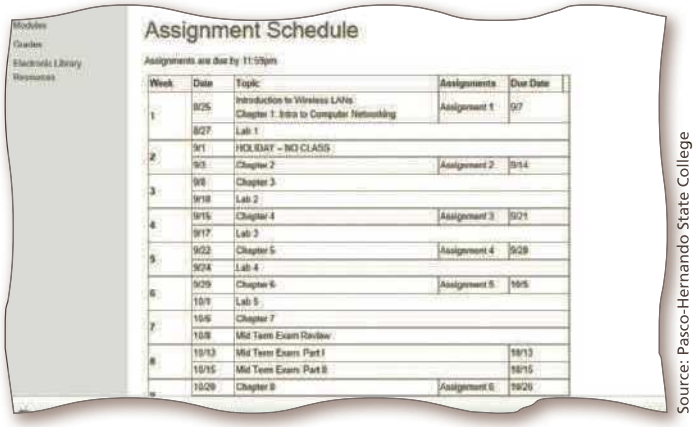
An **extranet** is a private network that uses Internet technologies to share business information with select corporate partners or key customers. Companies and other organizations can use an extranet to share product manuals, training modules, inventory status, and order information. An extranet might also allow retailers to purchase inventory directly from their suppliers or to pay bills online.

Companies use websites to advertise or sell their products and services worldwide, as well as to provide technical and product support for their customers. Many company websites also support **electronic commerce (e-commerce)**, which is the buying and selling of goods and services on the Internet. Using e-commerce technologies, these websites allow customers to browse product catalogs, compare products and services, and order goods online. Figure 1–9a shows wayfair.com, a company that uses an e-commerce website to sell and distribute home furnishings. Many e-commerce websites also provide links to order status information, customer service, news releases, and customer feedback tools to solicit comments from their customers.

(a) Wayfair

Source: Wayfair

(b) LMS



Source: Pasco-Hernando State College

(c) Facebook

Source: Facebook

(c) Blog

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Figure 1–9

Colleges, universities, and other schools use websites to distribute information about areas of study, provide course information, and register students for classes online. Many educational institutions use a **Learning Management System (LMS)** to simplify course management. An LMS is a web-based software application designed to facilitate online learning. Instructors use the LMS to communicate announcements, post questions on reading material, list contact information, and provide access to

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lecture slides and videos. Students use the LMS to find information related to their courses, including project instructions and grades. Many LMS tools allow instructors to write their own webpage content that provides further information for their students. For example, the LMS webpage in Figure 1–9b is an HTML page written by an instructor to provide an assignment schedule to students.

While organizations create commercial and academic websites, individuals might create personal websites to share information with family and friends. Families and other groups can exchange photographs, video and audio clips, stories, schedules, or other information through websites. Many individual websites allow password protection, which creates a safer environment for sharing information. Another popular type of website is a social media site, such as Facebook, Twitter, or LinkedIn (Figure 1–9c). These websites encourage their users to share information, pictures, videos, and job-related skills. Many business websites also include links to their social media pages.

People use search engine websites to research topics. Popular search engine sites include Google, Bing, and Yahoo!. A news website provides information about current events. Another type of common website is a blog, which is short for weblog. A single person or small group creates and oversees a blog, which typically reflects the author's point of view on a particular topic (Figure 1–9d).

Planning a Website

When visiting a physical retail store, visitors are more likely to make a purchase if the store is clean and well organized and offers quality products and services. Likewise, computer users have several expectations when visiting a website. They expect the website to load quickly in the browser. If a website takes more than a few seconds to load, a visitor is likely to leave and find another site, possibly belonging to a competitor. Website visitors also expect an attractive design and color scheme that enhances the experience of visiting the site and makes it easy to read and view information. They expect a clear navigation system that helps them quickly find the products, services, or information they are seeking. A poor design, distracting color scheme, or confusing website navigation tools also prompt visitors to switch to another website. An attractive, useful, and well-organized website is not created by accident. Building a successful website starts with a solid strategic plan.

Web designers begin planning activities by meeting with key business personnel to ask several important questions to understand the purpose of the website and the goals of the business. If you are a web designer working as a consultant or contractor, you meet with your clients to plan the website. If you are a web designer providing services within an organization, you meet with decision makers and others who are sponsoring the web design project. In either case, you begin by identifying the purpose of the website and goals of the business to help shape the design and type of website you are developing.

Purpose of the Website

The purpose of a commercial business website is related to the goal of selling products or services. A business can take a direct approach and use a website to sell products and services through e-commerce or through information that prompts website users to visit a physical location such as a store or restaurant. As an alternative, a business can take an indirect approach and use a website to generate leads to potential customers, promote the expertise of the business, raise the public profile of the business, or inform and educate its customers. Each purpose demands a different type of website and design. For example, if the purpose of a website is to serve as an

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online store, the website should allow easy access to product information, reviews, and e-commerce tools. If the purpose of the website is to build a company's reputation, the website should feature articles about the company, its employees, and its products and integrate with social media sites such as Facebook.

Every business needs to have a mission statement that clearly addresses the purpose and goal of the business. For example, the mission statement of a bank might be "Our mission is to provide world-class service while helping our customers achieve their financial goals." The business website should promote the mission statement. Web designers often ask their clients for a copy of the mission statement and use it as the foundation for the website plan. The more you know about the purpose of the website, the more likely you are to be successful with a web development project.

Target Audience

In addition to understanding the website's purpose, you should understand the people who will use the website, also known as the target audience. Knowing the makeup of your target audience — including age, gender, general demographic background, and level of computer literacy — helps you design a website appropriate for them. Figure 1–10 shows the website for Michaels, an arts and crafts store. Its target audience includes creative people who enjoy making decorations and other items. The home page displays an image customized for the year-end holiday season and offers special savings to further entice its target audience to make a purchase. The simple navigation bar near the top of the page makes it easy for a customer to shop, discover a new project, or find inspiration. A search tool above the navigation bar provides quick access to products. Knowing the information that your target audience is searching for means you can design the site to focus on that information, which enhances the shopping and purchasing experience of your audience.

Source: Michael's

Figure 1–10

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