

SHELLY CASHMAN SERIES®

NINTH EDITION

RESPONSIVE WEB DESIGN

WITH **HTML 5** & **CSS**

MINNICK

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Australia • Brazil • Mexico • Singapore • United Kingdom • United States

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Ninth 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 *Responsive Web Design with HTML 5 and CSS, Ninth 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

Responsive Web Design with HTML 5 and CSS, Ninth 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 integrating interactivity using CSS 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

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. Please 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.

Custom Fonts

Learn how to integrate custom fonts. You are no longer limited to standard browser fonts. Expand your font options by integrating custom Google fonts.

Design Single- and Multiple-Column Layouts

Learn how to design single-column and multiple-column layouts using the CSS Grid Layout. Create a single-column design for a mobile layout and a multiple-column layout for progressively larger screens.

Interactivity with CSS and JavaScript

Learn how to integrate transforms and animations, which provide interactivity to a webpage. Create a working hamburger icon menu exclusively for a mobile viewport.

Design for Accessibility

Learn how to add closed captions to videos.

Introduction to Bootstrap

Learn how to use Bootstrap, a popular web framework, to create an entire webpage.

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.

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.

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

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.

HTML 340 HTML Chapter 7 Improving Web Design with New Page Layouts

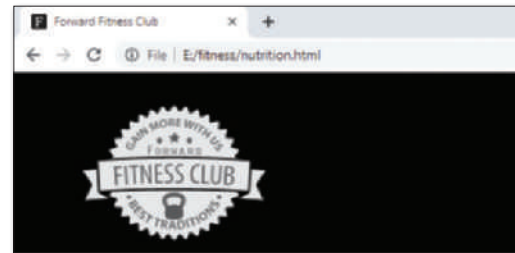


Figure 7-3

Roadmap

In this chapter, you will learn how to create the webpages shown in Figures 7-1, 7-2, and 7-3. The following roadmap identifies general activities you will perform as you progress through this chapter:

1. **MODIFY** the **HOME PAGE**.
2. **STYLE** the **HOME PAGE** elements.
3. **MODIFY** the **ABOUT US PAGE**.
4. **CREATE AND STYLE** the **NUTRITION PAGE** elements.
5. **ADD** a **FAVICON**.

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 4 **CREATE & STYLE NUTRITION PAGE** activity.

1 MODIFY HOME PAGE | 2 STYLE HOME PAGE | 3 MODIFY ABOUT US PAGE
4 CREATE & STYLE NUTRITION PAGE | 5 ADD FAVICON

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

Using HTML 5 Semantic Elements

Recall from Chapter 2 that HTML 5 semantic elements are a set of starting and ending HTML tags that provide meaning about the content of the tags. For example, the navigation system is contained within the <nav> and </nav> tags; likewise, footer content is contained within the <footer> and </footer> tags.

Use HTML 5 semantic elements for specific types of content within a webpage. The name of the tag reflects its purpose. Using semantic HTML 5 elements provides a standard naming convention for webpage content, making webpages more universal, accessible, and meaningful to search engines.

- 3 Tap or click the Select Folder button to select the fitness folder.
- Tap or click the Web Server URL(s) link <http://127.0.0.1:8887> to open the Forward Fitness Club website Server for Chrome (Figure 9-32).

Q&A Why did the home page open?
Unless specified otherwise, Web Server for Chrome opens the index.html file by default.

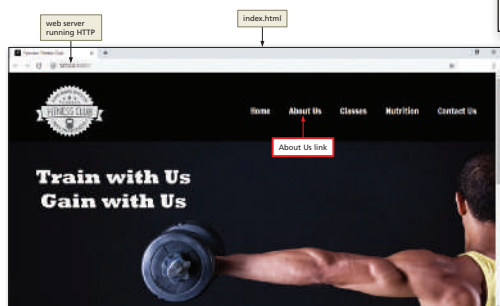


Figure 9-32

- 4 Tap or click the About Us link to open the webpage.
- Locate the More Options button on the right side of the video controls to prepare to display the video options (Figure 9-33).



Figure 9-33

Explanatory callouts summarize what is happening on screen.

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

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.

Apply Your Knowledge

Reinforce the skills and apply the concepts you learned.

Using Tables

Note: To complete this assignment, you will be required to refer to the Data Files.

Instructions: In this exercise, you will use your text editor to create an HTML page. First, you insert a table element. Next, you add a table caption. Then, you create style rules to format the table. Work with the apply08.css file in the apply\css folder from the Data Files. You will also use professional web comment, and validate your code.

Product	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Tablets	\$24,500	\$21,535	\$20,217	\$28,575
Monitors	\$12,825	\$12,400	\$11,980	\$14,233
Laptops	\$33,000	\$32,750	\$31,595	\$32,465
Desktops	\$21,478	\$20,895	\$18,280	\$21,625

Figure 8-67

Perform the following tasks:

1. Open index.html in the chapter08\apply folder from the Data Files in your text editor. Review the page, add a title, modify the comment at the top of the page to include your name and today's date, and replace "Student's Name" with your name in the footer element.
2. Open the apply08.css file from the apply\css folder. Modify the comment at the top of the style sheet to include your name and today's date.
3. In the index.html file, add a `table` element within the `main` element.
4. Nest the following caption element within the `table` element:
`<caption>2025 Sales by Quarter</caption>`
5. Insert five table rows after the caption and include a comment that specifies the row number. Follow the example below:
`<tr><!-- Row 1 -->
</tr>`

Continued >

Chapter Summary

In this chapter, you learned how to create a CSS file with rules to style HTML elements on a webpage. You linked the CSS file to all of the webpages for the fitness website. The items listed below include all the new concepts and skills you have learned in this chapter, with the tasks grouped by activity.

Using Cascading Style Sheets

Inline, Embedded, and External Style Sheets (HTML 147, HTML 148)
CSS Basics (HTML 149)
CSS Text Properties (HTML 150)
CSS Colors (HTML 151)

Understanding Inline Elements and Block Elements

CSS Box Model (HTML 154)

Creating an External Style Sheet

Create a CSS File (HTML 157)
Create a Style Rule for the Body Element (HTML 157)

Linking an HTML Document to a CSS File

Link HTML Pages to the CSS File (HTML 159)

Creating a Webpage Layout

Set Float and Clear Properties (HTML 161)

Creating Style Rules for Structural Elements

Create Style Rules for the Header, Nav, Main, and Footer Elements (HTML 163–HTML 178)

Modifying the Nav to use an unordered list

Create a Style Rule for the Unordered List within the Nav (HTML 169)

Create a Style Rule for the List Items within the Nav (HTML 170)

Create a Style Rule for the List Item Anchor Elements within the Nav (HTML 170)

Creating Responsive Image

Create a Style Rule for `img` Element (HTML 173)
Remove Height and Width Attributes from `img` Elements (HTML 174)

Creating Style Rules for ID and Class Attributes

Create a Style Rule for ID Attributes (HTML 179)

Use the `span` Element (HTML 184)

Create a Style Rule for Class Attributes (HTML 184)

Creating a CSS Reset

Create a CSS Reset Style Rule (HTML 190)

Adding Comments to CSS Files

Add Comments to a CSS File (HTML 193)

Validating CSS Files

Validate the CSS File (HTML 195)



CONSIDER THIS

What decisions will you need to make when creating your next CSS file?

Use these guidelines as you complete the assignments in this chapter and create your own websites outside of this class.

1. Determine properties for your HTML elements (such as header, nav, main, and footer).
 - a. Set webpage width and centering characteristics.
 - b. Decide on any necessary text properties to use for font face, size, and style.
 - c. Set text and background colors.
 - d. Decide if you need borders, and then set the style, size, and color of the border.
 - e. Float any content that needs to appear on the same line.
 - f. Determine the amount of margins and padding to use.
2. Link the CSS file to your HTML pages and website template.
 - a. Add comments to your CSS file, noting the declarations for each selector.
 - b. Validate your CSS file to confirm that it does not contain any errors.
 - c. View your website in a browser to see the applied styles throughout the development process.
 - d. Determine any changes that need to be made and revalidate.
3. Depending on the structure of your website, determine if you should create additional CSS files to accommodate multiple wireframes or different media such as mobile or print. Styling for multiple devices will be covered in later chapters.

CONSIDER THIS

How should you submit solutions to questions in the assignments identified with a  symbol? Every assignment in this book contains one or more questions identified with a  symbol. These questions require you to think beyond the assigned presentation. Present your solutions to the questions in the format required by your instructor. Possible formats may include one or more of these options: create a document that contains the answer; present your answer to the class; discuss your answer in a group; record the answer as audio or video using a webcam, smartphone, or portable media player; or post answers on a blog, wiki, or website.

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

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.

Working with Positions

Instructions: In this exercise, you will create and modify style rules to learn more about how to place elements on a page using positions. An example of page element positions is shown in Figure 5–66.

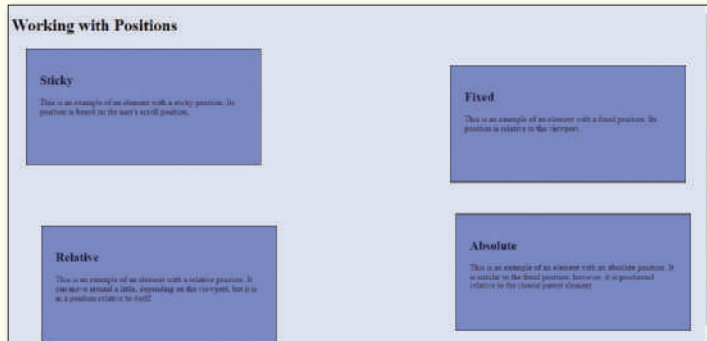


Figure 5–66

Perform the following tasks:

1. Open your text editor and then open the index.html file in the chapter05\extend folder from the Data Files. Update the comment with your name and today's date.
2. Open index.html in your browser to view the file.
3. Open the extend05.css file in your text editor. Locate the "sticky" rule for the sticky class selector. Add a declaration for the position property with a value of sticky. Add a declaration for the top property and specify a zero value. Save your file, and scroll down to view the changes. In the index.html file, locate the sticky div element to identify the values you used and how it affected the relative box.
4. In the extend05.css file, locate the "relative" comment and create a class selector. Add a declaration for the position property with a value of relative. Add another declaration for the top property and specify a value of 90 pixels. Add a declaration for the left property with a value of 30 pixels. Save your file, and scroll down to view the changes. Return to extend05.css and change the left property values to a value of your choice. In the index.html file, locate the relative div element to identify the values you used and how it affected the relative box.

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.

19. Save your changes and refresh extend06.html in your browser to view the changes.
20. Save your files and submit them in a format specified by your instructor.
21. In this exercise, you explored more about gradients and used percentages to set color stops. You also used rgba to set transparency in step 14. Use your browser to research how to set gradient color stops using percentages. Also research how to use the rgba() function to create transparency. Include a description of your findings.

Analyze, Correct, Improve

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

Modifying Media Queries

Note: To complete this assignment, you will be required to use the Data Files. Please contact your instructor for information about accessing the Data Files.

Instructions: The analyze06.html webpage is a draft website template, but must be corrected and improved for responsive design before presenting it to a client. Use Figure 6–63, Figure 6–64, and Figure 6–65 as a guide to correct these files.



Figure 6–63

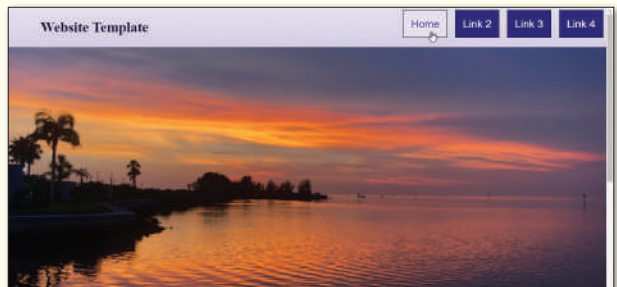


Figure 6–64

Continued >

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.


Textbook Walk-Through

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 independent exploration.

STUDENT ASSIGNMENTS

HTML 500 HTML Chapter 9 Integrating Audio and Video

Analyze, Correct, Improve *continued*

- g. Validate the HTML file and correct any errors.
- h. Submit the assignment in the format specified by your instructor.
- i.  Use your browser to research screen readers. What are the most popular screen readers? Is there a screen reader extension available for Google Chrome?

In the Lab

Labs 1 and 2, which increase in difficulty, require you to create webpages based on what you learned in the chapter; Lab 3 is ideal for group projects/collaboration.

Lab 1: Adding Audio to the Strike a Chord Website

Problem: You work for a local music lesson company called Strike a Chord that provides music lessons for piano, guitar, and violin. The company needs a web presence and has hired you to create their website. You have already created the website and now need to add audio to the Lessons page. Figure 9–39 shows the Lessons page with the audio files.

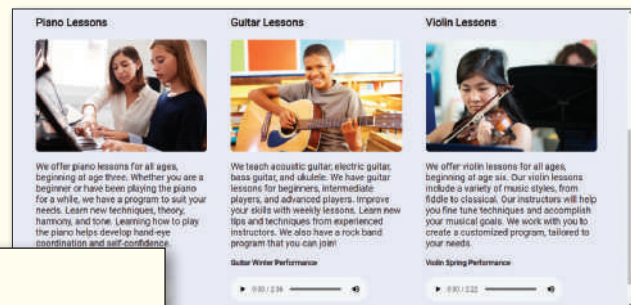


Figure 9–39


the following tasks:
order and create a new subfolder named media. Copy the Data Files from our media folder.
ml file in your text editor and update the comment with today's date.
after the paragraph element, insert two new blank lines and then add an text, **Piano Spring Performance**.
t, add an audio element with the **controls** attribute.
nt within the audio element that specifies the **piano.mp3** as the source media folder, and **audio/mp3** as the type.
element that specifies the **piano.ogg** as the source file and **audio** ment, provide fallback text for legacy browsers that do not support the

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

STUDENT ASSIGNMENTS

HTML 504 HTML Chapter 9 Integrating Audio and Video

In the Lab *continued*

13. Check your spelling. Validate all HTML and CSS files and correct any errors. Save your changes.
14. Submit your assignment in the format specified by your instructor.
15.  Identify the resource you used to make your video. Identify the resource you used for audio. Identify the resource you used for file conversions.

Consider This: Your Turn


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

1. Adding Audio to Your Personal Portfolio Website

Personal

Part 1: You have already developed a responsive website for your personal portfolio and now need to add audio to the website.

1. Open your portfolio folder and create a new subfolder named media.
2. Add the **audio** element to one of your webpages. Review your webpages to determine which page will use the audio element.
3. Determine which attributes to include for the **audio** element. Include at least two source files. You may use an existing audio file that you have, you may create an audio file, or you can research the Internet for a free audio resource, such as freemusicarchive.com. Save your audio source files in your portfolio/media folder.
4. Provide fallback text for legacy browsers that do not support the video element.
5. Save and test your files.
6. Validate and correct your HTML file as needed.
7. Submit your assignment in the format specified by your instructor.

Part 2:  Discuss the reasons you should or should not include audio on your portfolio webpage.

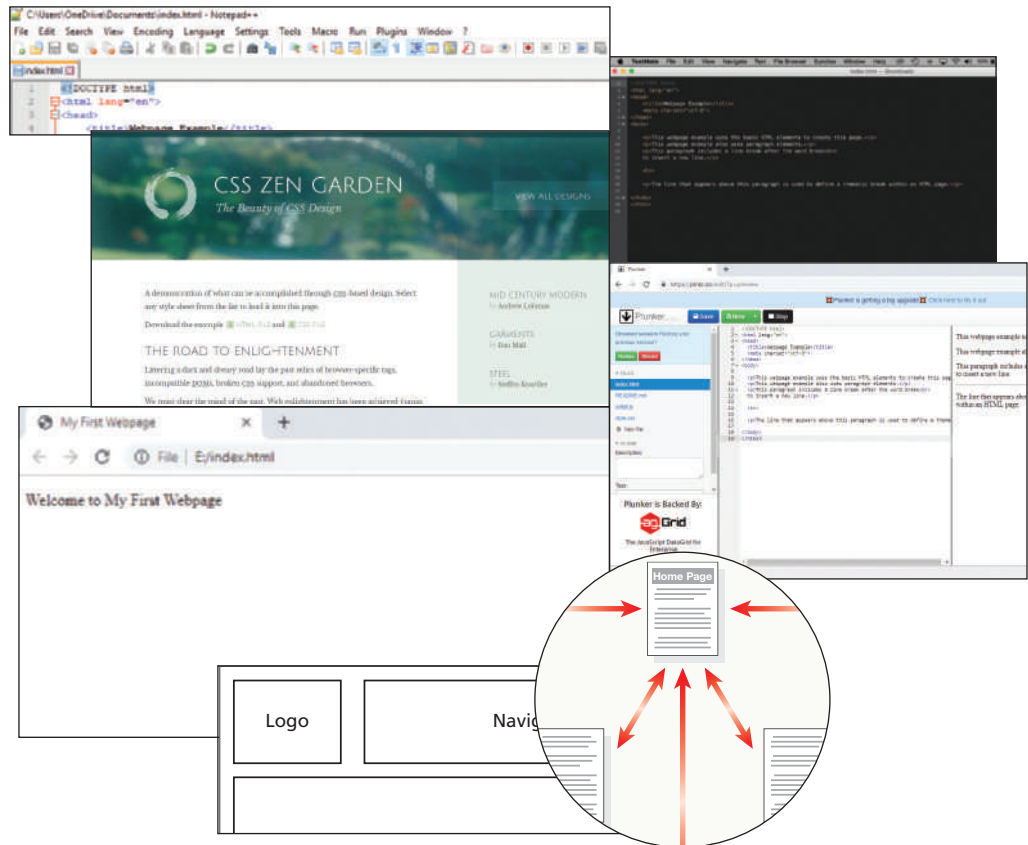
2. Adding a Video to the Dog Grooming Website

Professional

Part 1: You have already created a responsive design website for a dog grooming business, but now need to add a video to the website and make it accessible.

1. Open your groom folder and create a new subfolder named media. Copy the Data Files from chapter09/your_turn2 to your groom/media folder.
2. Open the index.html file in your text editor. Add a video element at the end of the welcome div. Include the controls attribute and a poster attribute that uses the image file of your choice.
3. Nest a source element within the video element that specifies **groom.mp4** as the source file and **video/mp4** as the type.
4. Nest another source element that specifies **groom.webm** as the source file and **video/webm** as the type.
5. Open the media/captions.vtt file in your text editor. Add your name and date to the NOTE. Use Table 9–9 to create a captions file.

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
- Design for 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

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.

HTML 5.2 is the most recent version of HTML and is called HTML 5. Before exploring the details of creating webpages with HTML 5 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. Content is displayed in two areas within the web browser. One part of the code indicates that text should be displayed as the webpage title, which appears in the browser tab. Another part of the code specifies that a line of text should appear as a paragraph within the browser window.

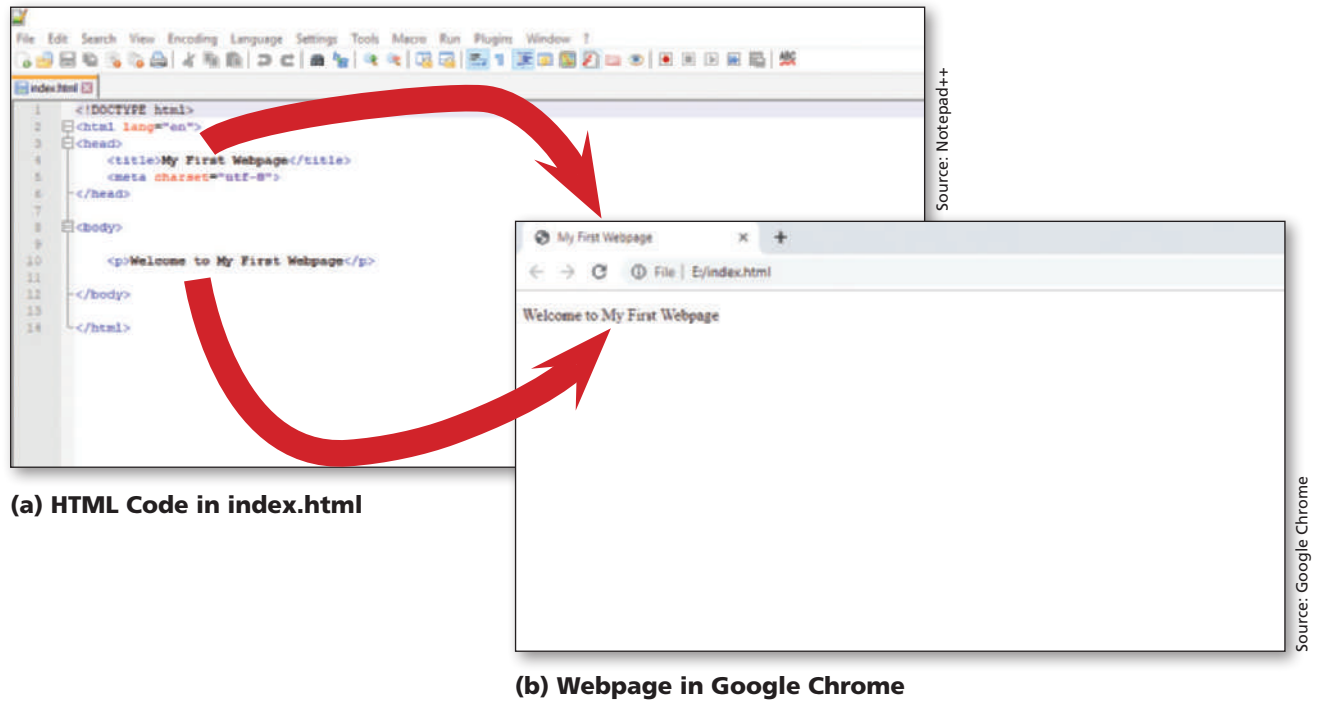


Figure 1-1

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

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.

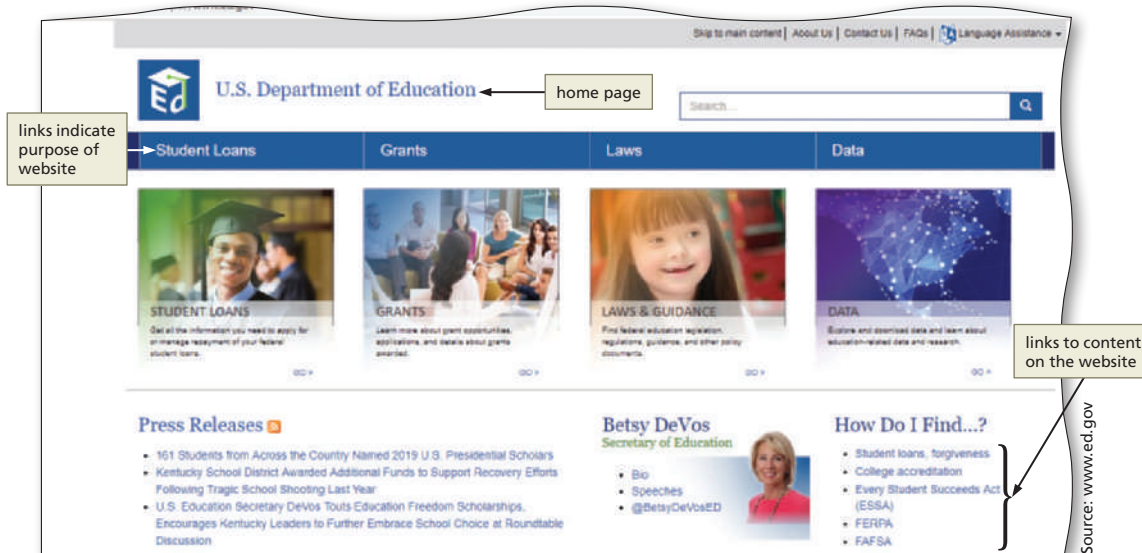


Figure 1–3

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.

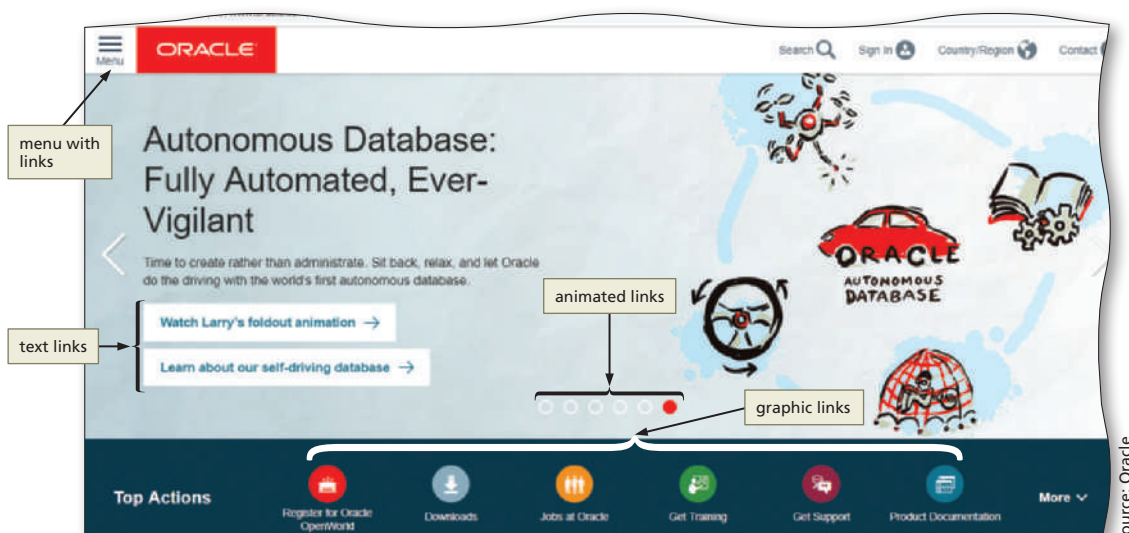


Figure 1–4

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).

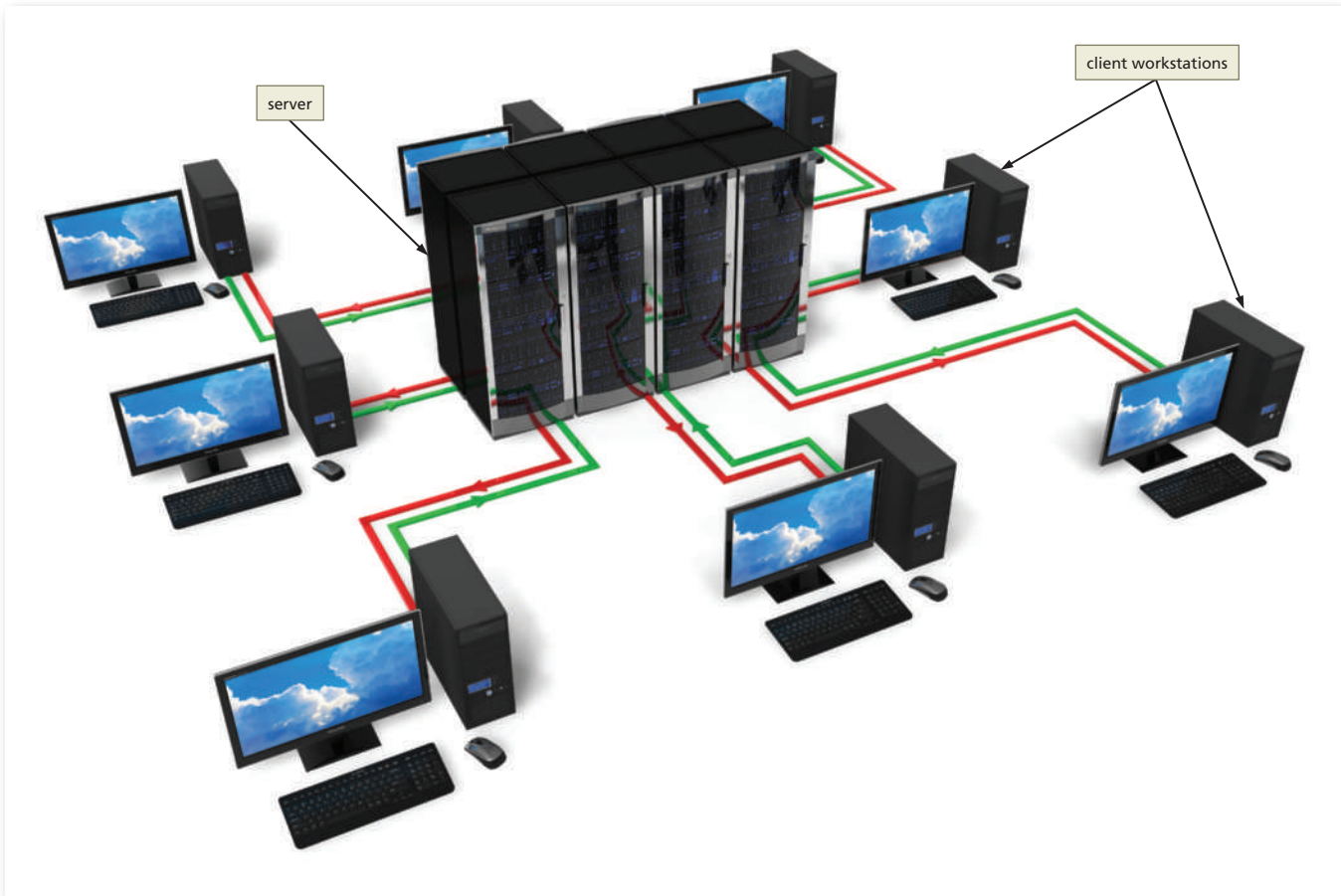


Figure 1–5

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

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 in 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.

BTW

WhatIsMyIPAddress.com

You can look up the IP address for any domain using WhatIsMyIPAddress.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 Edge, 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.

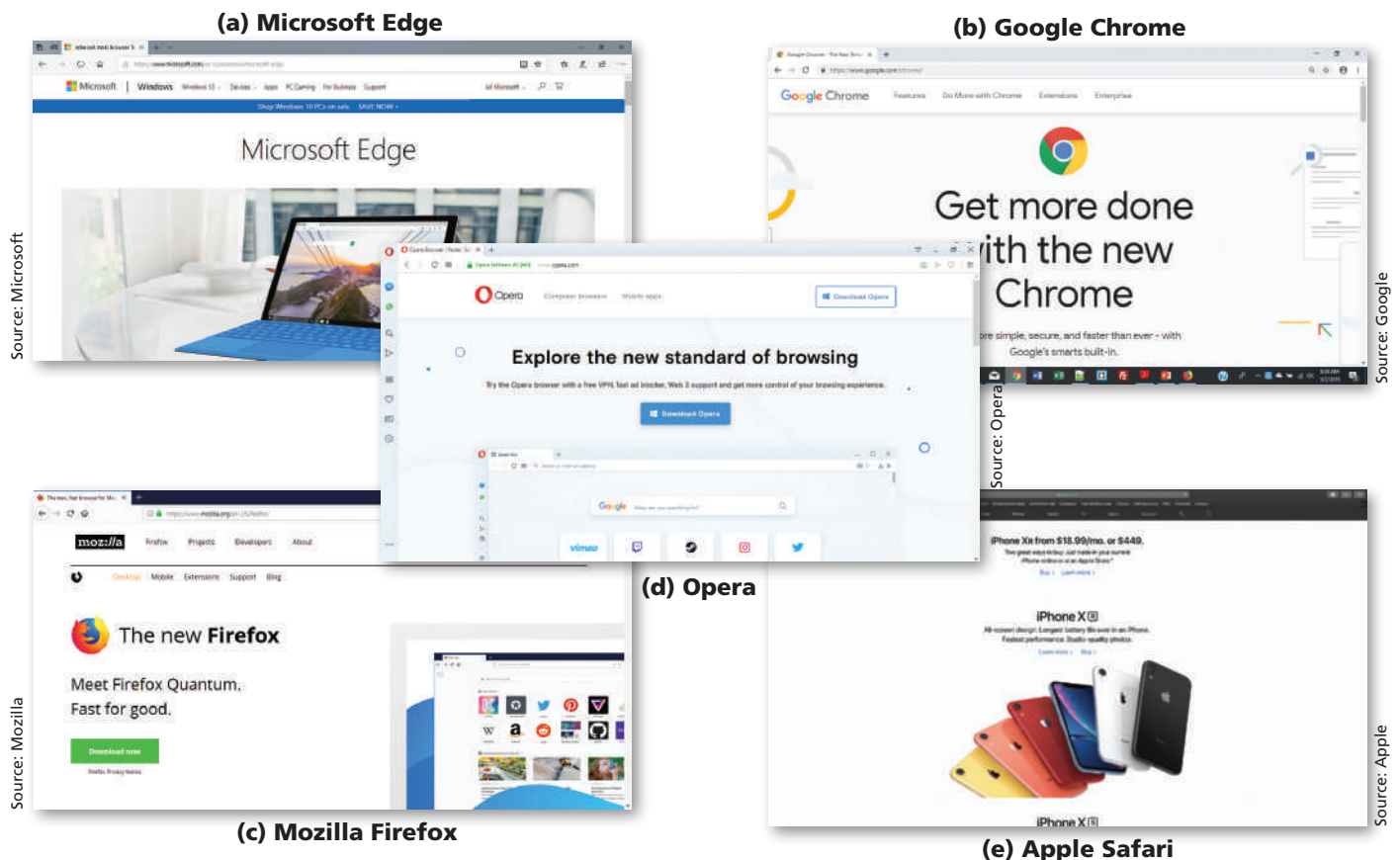


Figure 1–6

BTW

Apple Safari

Apple Safari is only available for download on Apple devices, including iPhones and Mac computers. It previously ran on the Windows operating system, but as of 2018, Apple no longer offers Safari for Windows.

BTW

Browser Interface Updates

The user interface of a browser is updated regularly. If you are using Google Chrome, it may look slightly different from the figures due to recent updates.

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 HTML 5 standards. As you are designing your website, you must view it using various browsers to ensure that it looks and functions as you intended.

Google Chrome (Figure 1–7) provides tools for visiting webpages and an array of options to customize settings. As with all browsers, you can use Google Chrome 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. At the time of this writing, Google Chrome is the most popular browser, with more than 60 percent market share worldwide. You can download Google Chrome for free at google.com/chrome. Important features of Google Chrome are summarized in Table 1–1.

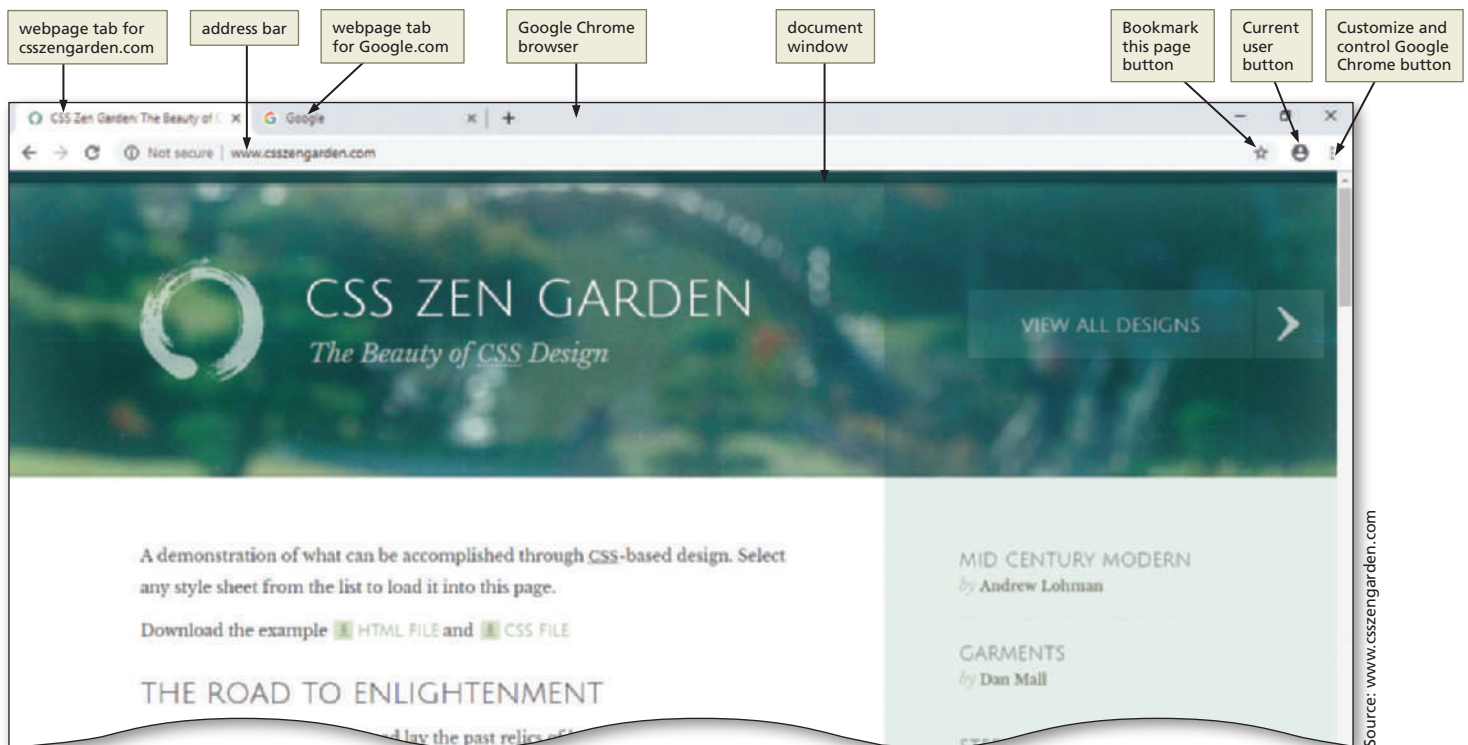


Figure 1–7

Table 1–1 Features of Google Chrome

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
Current user button	Allows you to sign in to Google and manage your passwords, payments, and addresses
Bookmark this page button	Allows you to save and view your favorite webpages
Customize and control Google Chrome button	Provides access to print, zoom, and history features and lets you view downloads and manage extensions
Document window	Displays the current webpage content

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.

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.w3.org.com. To access a website using a browser, you type the webpage's URL in the browser's address bar (Figure 1–8).

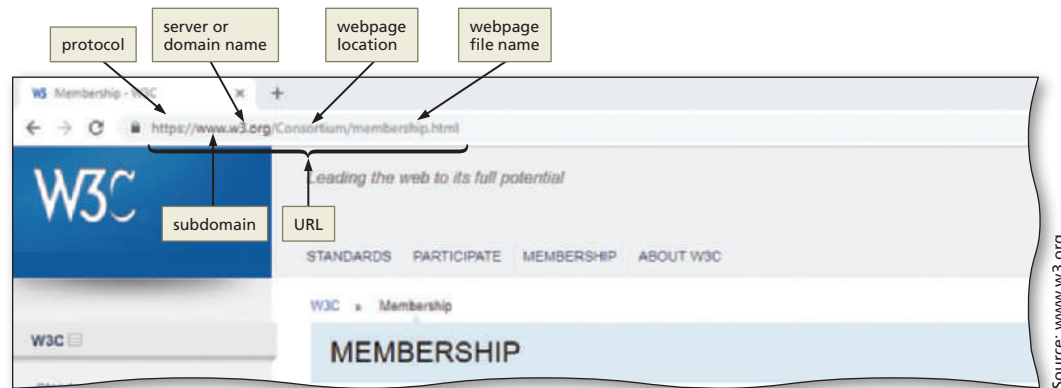


Figure 1–8

The URL in Figure 1–8 indicates to the browser to use the HTTPS communications protocol to locate the `membership.html` webpage in the Consortium folder on the `w3.org` server or domain. A **domain** is an area of the Internet a particular organization or person manages. In this case, `w3.org` is the name of the domain, with the `.org` indicating it is registered as a nonprofit organization. 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.

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.