



# principles of web design

Joel Sklar

sixth edition

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# PRINCIPLES OF WEB DESIGN

SIXTH EDITION

Joel Sklar



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# PREFACE

*Principles of Web Design, Sixth Edition* leads you through the entire web site creation process, from start to finish, while developing and enhancing your HTML, CSS, and visual design skills along the way. You will learn how to create accessible web sites that let users easily and quickly navigate through your information, regardless of browser type, connection speed, or browsing device. You will also explore the principles of responsive design, a new method of designing web sites that adapt to devices ranging from mobile phones to desktop monitors. Whether you are building a site from scratch or redesigning an existing site, the principles presented in this book will help you deliver your web content in a more responsive, accessible, and visually exciting way.

This edition reflects the latest in web design trends with expanded sections, plenty of new content, and an updated topic flow. The examples and activities emphasize building standards-based web designs using the latest web technologies including HTML5 and CSS3. You will learn how the smartphone and tablet revolution has changed the nature of web design and how to respond to those changes. You will examine current web design theories and view a variety of web sites, learning to focus on both the user's needs and the requirements of the content you want to deliver. In addition, you will learn about the web project design process and see how to turn an initial rough sketch into a finished layout. Through hands-on activities, you will gain experience controlling all web design aspects including typography, color, backgrounds, page layout, and navigation.

Updated illustrations and screen shots throughout the book reflect current browser, device, and web design trends.

## Intended Audience

*Principles of Web Design, Sixth Edition* is intended for anyone who wants to learn how to design and build attractive, informative web pages. You may use this book because you are taking a college or high school web design course or you may be teaching yourself how to



build web pages. A basic working knowledge of HTML is an advantage but not necessary to use this book. You should have a good working knowledge of using computers and be able to manage your file system, including copying, moving, and renaming files and folders.

## Approach

As you progress through the book, you practice the design techniques by studying the supplied coding samples, looking at the example pages and web sites, and applying the principles to your own work. Each chapter concludes with a summary, individual and team project ideas, and a review section that highlights and reinforces the major concepts of each chapter. To complete a case project, you should complete each chapter in sequence.

## Overview of This Book

The examples and exercises in this book will help you achieve the following objectives:

- › Learn how to use HTML and CSS to create web pages.
- › Learn about the latest release of HTML, called HTML5, and see how it can adapt to a variety of web design needs.
- › Learn about the latest release of CSS, called CSS3, and see how you can control display and formatting characteristics for your web page designs.
- › Understand the effects of browser and device type on your design choices.
- › Learn to build portable, accessible, responsive web sites that present information with clarity and appeal.
- › Gain a critical eye for evaluating web site design.
- › Effectively use graphics, typography, and color in your work.
- › Build user-focused navigation to help your users find content easily.
- › Use CSS layout techniques to build responsive page layouts.

In **Chapter 1** you will explore how HTML is used along with CSS to create web pages, learn about the new elements and capabilities of HTML5, how to choose the best syntax for the web pages you are going to create, and how to create correct code. **Chapter 2** covers the design principles that you will apply to your web page design as you work through the book. You will look at a variety of web sites and learn to focus on both the user's needs and information requirements of your site. You will also consider strategies for adapting content to display on devices ranging from desktop computers to smartphones. In **Chapter 3** you will learn about the web development project lifecycle and the value of planning your web site before you start coding. You will also examine important file naming and directory conventions. After exploring how to create a flowchart that depicts the information structure of your site, you will learn how to publish your site to the web and plan for ongoing

site maintenance and updates. **Chapter 4** introduces CSS, including its basic syntax and selection techniques, and explains how to control style information in a single file or across an entire web site. **Chapter 5** explains how you can use CSS as a potent style language to manipulate a variety of text properties to achieve professional, effective typographic design.

**Chapter 6** introduces the CSS visual formatting model and the box model, which control the way content is displayed on a web page. You also explore the CSS box properties to set the margin, padding, and border characteristics of block-level elements and to enhance the display of content in the browser. **Chapter 7** expands on the concepts introduced in Chapter 6, and demonstrates how to use floats and other CSS layout techniques to create multicolumn web pages that can either be flexible based on the browser size and screen resolution, or fixed to a definite width. This chapter also explores how to use the HTML5 sectioning elements. **Chapter 8** explains the effective use of images and color on your web site, including image file formats, correct use of the <img> element, web site color schemes, and computer color basics. This chapter also discusses how to use CSS to control color properties and background images. **Chapter 9** focuses on navigation and how to help your users find content easily, know where they are at all times, and see where they can go within your web site whether it is displayed on a mobile device or desktop monitor. **Chapter 10** discusses how to use CSS to create attractive, legible data tables. In **Chapter 11**, you will learn how to work with HTML form elements to build interactive web pages that collect information from a user and process it on the web server. Finally, in **Chapter 12**, you will apply a wide variety of skills you learned in the book to build responsive web pages using navigation schemes and images that seamlessly adapt to the size of a user's device. The appendices provide reference information which may be useful as you use the book or work on your own. **Appendix A** provides a reference to HTML5, including a table of HTML5 elements listed in alphabetic order. **Appendix B** provides a reference to CSS, including a table of CSS3 properties listed in alphabetic order. **Appendix C** explains how to use print style sheets to let users print legible versions of web pages.

## Features

*Principles of Web Design, Sixth Edition* contains many teaching aids to assist the student's learning.

- › **Chapter objectives:** Each chapter in this book begins with a list of the important concepts to be mastered within the chapter. This list provides you with a quick reference to the contents of the chapter as well as a useful study aid.
- › **Illustrations, tables, and screen shots:** Illustrations help you visualize common components and relationships. Tables list conceptual items and examples in a visual and readable format. Updated screen shots reflect the latest technology being used in web design.

- › **Notes:** Chapters contain Notes designed to provide you with practical advice and proven strategies related to the concept being discussed.
- › **Modern web design techniques:** All new content on HTML5 and CSS3-based layouts demonstrate the latest methods for creating web pages using standards-based design techniques.
- › **Full color web page illustrations:** Web page figures and other illustrations are shown in full color so you can assess how color affects web page content and how designers use color effectively in sample web sites.
- › **Activities:** Many chapters include step-by-step instructions for applying the principles and practicing the skills taught in the chapter. Sample files are provided to give students a head start on creating web pages.
- › **Skills at Work sidebars:** Each chapter includes a short article on the skills students need to succeed as a professional web designer.
- › **Chapter summaries:** Each chapter's text is followed by a summary of chapter concepts. These summaries provide a helpful way to recap and revisit the ideas covered in each chapter.
- › **Key terms:** Each chapter includes a list of newly introduced vocabulary. The list of key terms provides a mini-review of the major concepts in the chapter.
- › **Review Questions:** End-of-chapter assessment begins with a set of approximately 15 to 20 review questions that reinforce the main ideas introduced in each chapter. These questions ensure that you have mastered the concepts and have understood the information you have learned. Some questions have been updated for the Sixth Edition.
- › **Hands-On Projects:** Although it is important to understand the concepts behind web design topics, no amount of theory can improve real-world experience. To this end, along with conceptual explanations, each chapter provides Hands-On Projects related to each major topic aimed at providing you with practical experience. Some of these include researching information from people, printed resources, and the Internet, as well as installing and using some of the technologies discussed. Because the Hands-On Projects ask you to go beyond the boundaries of the book itself, they provide you with practice implementing web design skills in real-world situations. Many projects have been updated for the Sixth Edition.
- › **Case Projects:** The individual and team case projects at the end of each chapter are designed to help you apply what you have learned to business situations much like those you can expect to encounter as a web designer. Depending on instructor preferences, you can work on your own or with a team to independently synthesize and evaluate information, examine potential solutions, and make recommendations,

much as you would in an actual design situation. These have also been updated for the Sixth Edition.

### Online Companion

The online companion to accompany *Principles of Web Design* has been an important component to this book since the First Edition. For the Sixth Edition, it offers greater enhancement to the textbook learning by providing updated information, web links for further research, and files containing the code used to produce the sample web pages shown in the figures. The URL for this site is [www.joelsklar.com/pwd6](http://www.joelsklar.com/pwd6).

### Instructor Resources

The following teaching tools are available at [sso.cengage.com](http://sso.cengage.com) to instructors who have adopted this book.

**Instructor's Manual:** The Instructor's Manual that accompanies this textbook includes additional instructional material to assist in class preparation, including Sample Syllabi, Chapter Outlines, Technical Notes, Lecture Notes, Quick Quizzes, Teaching Tips, Discussion Topics, and Key Terms.

**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

**PowerPoint Presentations:** Microsoft PowerPoint slides are available for each chapter. These are included as a teaching aid for classroom presentation, to make available to students on the network for chapter review, or to be printed for classroom distribution. Instructors can add their own slides for additional topics they introduce to the class.

**Data Files:** Files that contain all of the data necessary for the Activities and Hands-On Projects are provided for students at [www.cengagebrain.com](http://www.cengagebrain.com).

**Solution Files:** Solutions to the Activities, end-of-chapter Review Questions, Hands-On Projects, and Case Projects are provided.

## Read This Before You Begin

The following information will help you as you prepare to use this textbook.

### To the User of the Data Files

To complete the steps and projects in this book, you will need data files that have been created specifically for this book. Your instructor will provide the data files to you, or you

can obtain the files electronically from Cengage Learning by visiting [www.cengagebrain.com](http://www.cengagebrain.com) and then searching for this book title. Note that you can use a computer in your school lab or your own computer to complete the steps and Hands-On Projects in this book.

### Using Your Own Computer

You can use a computer in your school lab or your own computer to complete the chapters, Hands-On Projects, and Case Projects in this book. To use your own computer, you will need the following:

- › **Web browser**, such as Microsoft Internet Explorer, Mozilla Firefox, Google Chrome, Safari, or Opera.
- › **Code-based HTML editor**, such as Adobe Dreamweaver, one of the many shareware editors, or a basic text editor such as Notepad for Windows or SimpleText on the Macintosh.

### To The Instructor

To complete all the exercises and chapters in this book, your users must work with a set of user files, called the data files, which are posted at [sso.cengage.com](http://sso.cengage.com). Students can also obtain them electronically at [www.cengagebrain.com](http://www.cengagebrain.com). Follow the instructions in the Help file to copy the user files to your server or standalone computer. You can view the Help file using a text editor, such as WordPad or Notepad.

After the files are copied, you can distribute the data files for the users yourself, or tell them where to find the files so they can make their own copies of the data files. Make sure the files are set up correctly by having students follow the instructions in the “To the User of the Data Files” section.

### Cengage Learning Data Files

You are granted a license to copy the data files to any computer or computer network used by individuals who have purchased this book.

## Acknowledgments

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# CHAPTER 1

## HTML5

---

When you complete this chapter, you will be able to:

- › Create web pages with HTML
  - › Add style with CSS
  - › Describe the history of HTML
  - › Work with HTML5
  - › Use good coding practices
- 

In this chapter, you explore how HTML is used along with CSS to create web pages, and you learn the history of how HTML has evolved to its current state. As you will see, designing web pages has changed dramatically in the last few years. You will examine the latest release of HTML, called HTML5, and see how it can adapt to the future of the web. You will learn about the new elements and capabilities of HTML5, how to choose the best syntax for the web pages you are going to create, and how to create correct code. Finally, you will consider what type of software tool you can use to create your HTML code, and how to use good coding practices to make sure your work is useful now and in the future.



## Creating Web Pages with HTML

In just 25 years since its inception, the World Wide Web (or web for short) has become an integral part of daily life for millions of people around the world. According to *internetworldstats.com*, the Internet had over 2 billion users as of June 2012, with more new users every day, most using mobile devices such as smartphones and tablets to access their preferred web sites. Imagine your daily life without access to your favorite social media, news, entertainment, and shopping sites. Most of us have integrated the web to such a degree in our lives that we cannot resist constantly checking email, Twitter feeds, Facebook, and the myriad of other online media that have become an essential part of our daily lives.

Despite the diversity of content, all of the web pages on the World Wide Web have one thing in common: They all must be created using some form of the **Hypertext Markup Language (HTML)**. It is astonishing to think that the entire World Wide Web, used every day by millions, is based on a simple text-based markup language that is easy to learn and use.

HTML is a **markup language**, a structured language that lets you identify common sections of a web page such as headings, paragraphs, and lists with markup tags that define each section. For example, the `<h1>` element in the following code indicates that the text is a first-level heading:

```
<h1>What is HTML?</h1>
```

Web pages are simply text documents that use HTML to tell the browser how to display each document section. Figure 1-1 shows a basic web page and the code that is used to create it.

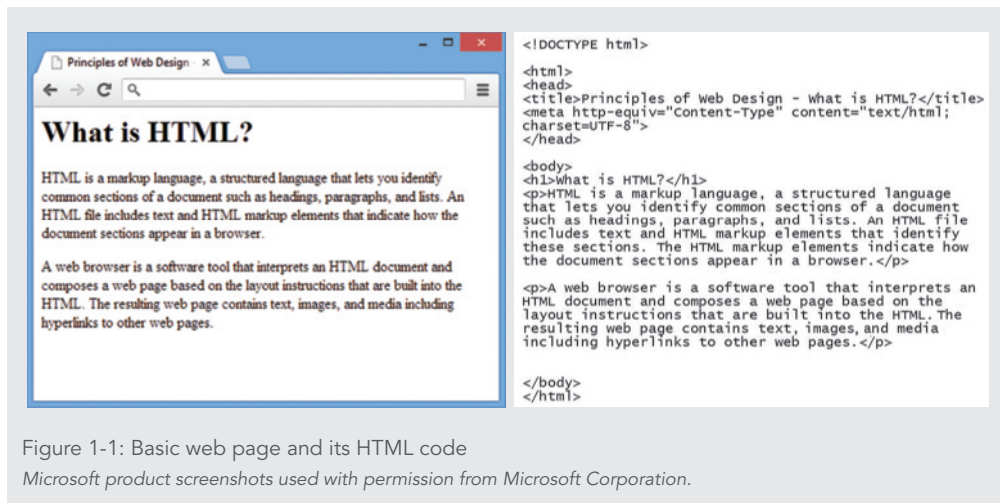


Figure 1-1: Basic web page and its HTML code  
Microsoft product screenshots used with permission from Microsoft Corporation.

## HTML Syntax

If you examine the HTML example in Figure 1-1, you see that the web page code is a mixture of the text the user sees in the browser surrounded by a variety of markup elements. In HTML, an **element** is a pair of HTML tags containing content. Figure 1-2 shows the syntax of an HTML element.

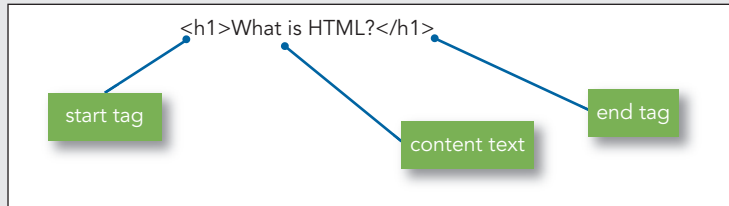


Figure 1-2: HTML element syntax  
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An HTML **tag** includes an opening bracket (<), an element name such as `h1`, and a closing bracket (>). Notice that the end tag has a slash (/) preceding the element. This indicates to the browser to end the `<h1>` element.

Many HTML elements let you build the structure for your web page content. For example, document headings are marked with one of a variety of heading tags, such as `<h1>` or `<h2>`, signifying a top-level or secondary-level heading. Paragraph content is marked with the `<p>` element. HTML offers many elements to expressly mark each section of a document. Appendix A contains a complete list of the HTML elements and their usage.

Some HTML elements contain only a single tag. These are known as **void elements** because they contain no content. Rather, they insert something onto the page, such as a new line using the `<br>` element. Void elements use only the opening tag, never an end tag. Void tags include the `<br>` element and `<img>`, the image element, which inserts an image that you specify. You will learn more about the `<img>` element in Chapter 8.

Each HTML element determines how the content will be organized and displayed in the browser. For example, the `<h1>` element creates a bold heading for any text it contains. Other HTML elements describe other types of text. The `<p>` element creates a paragraph of text as shown here.

```
<p>HTML is a markup language, a structured language that lets you identify common sections of a document such as headings, paragraphs, and lists. An HTML file includes text and HTML markup elements that identify these sections. The HTML markup elements indicate how the document sections appear in a browser.</p>
```

Some HTML elements support **attributes** that let you provide more information about an element. Here is an attribute (shown in bold) added to an `<h1>` element:

```
<h1 id="maintitle">Main Title of the Document</h1>
```

In the following example, the `src` attribute is added in bold to the `<img>` element to tell the browser which image to display.

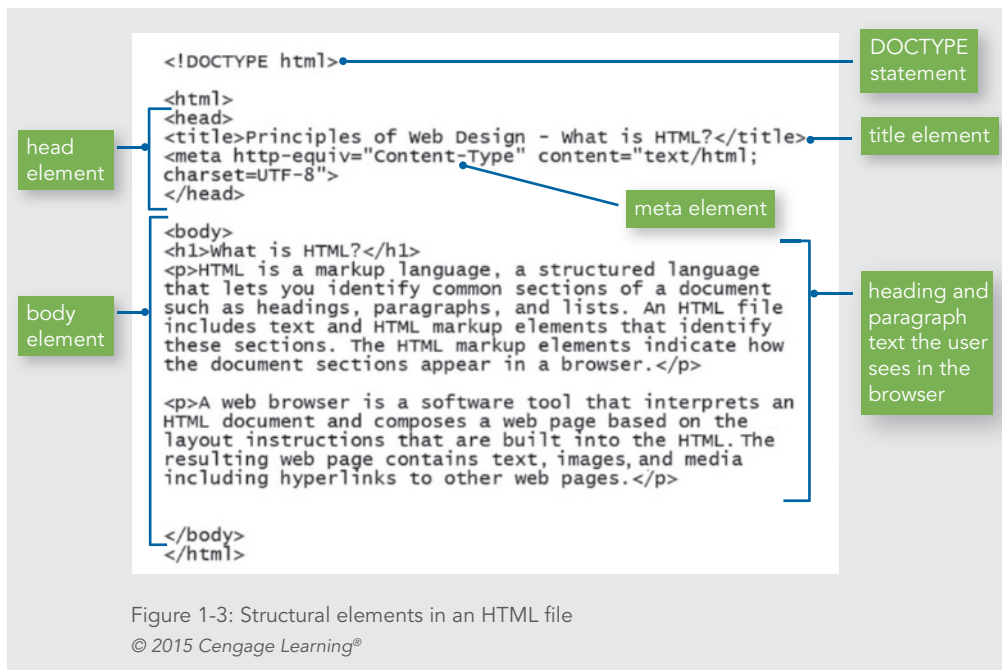
```

```

Attributes are always placed in the start tag of an HTML element. They are expressed in the form of a name and a value. The value should always be in quotes as shown in the two previous examples.

### Structure of a Basic Web Page

An HTML file includes the text that the user sees in the browser, contained within HTML markup elements the user cannot see. The HTML markup elements identify document sections and elements as shown in Figure 1-3.



The HTML code in this example demonstrates the basic structure of an HTML document. First, the **Document Type**, or **doctype** for short, specifies the rules for the document language so the browser knows how to interpret the HTML code and display it properly.

After the doctype statement, the opening `<html>` tag and its closing `</html>` tag at the end of the page are the root element of the document. A **root element** is the container element for all other elements in the document.

After the root element is the `<head>` tag. The two main sections of an HTML document are the head and body sections, represented by the `<head>` and `<body>` elements. The head section is the container for all of the descriptive information about the document, including the document title, coding standards, links to external style sheets, and scripting code for interaction. None of the content in the head section appears in the browser window.

The head section includes the important `<title>` element. This element contains the title of the document, which is shown in the title bar or page tab of the browser and appears as the bookmark text when the user bookmarks the page. Document titles should clearly describe the page, contain key terms, and be understandable out of their web site context. The content of `<title>` is a primary source of information for search engines and is often the first text users see in a list of search results. The head section also contains the `<meta>` element, which defines the content type as type “text/html” and declares the character set for the document.

The body section includes the content that the user sees in the browser window. The body of the document can contain text, images, video or audio content, forms for gathering information, interactive content, and hypertext links to other web resources. Here is where all of the various structural elements that make up HTML come into play.

You should use the HTML elements properly to describe each section of the document based on the logical structure of the document. For example, mark headings as headings, long quotes as `<blockquote>`, paragraphs as `<p>`, and so on. In the earlier days of the web, HTML elements were often misused, selected for how they looked in the browser rather than for their structural meaning. Avoid using this type of markup, and express all display information with Cascading Style Sheets, which you will read more about later in this section.

## Note

*Once you are familiar with the HTML syntax, you will find that one of the best ways to learn new coding techniques is to find a web page you like and view the source code. All of the major browsers let you right-click a blank spot in the browser window and then choose View Page Source, View Source, or a similar command.*

### Activity: Building a Basic HTML5 Document

In this activity, you build a basic HTML file and test it in the browser. The new code to add is displayed in blue text in the following steps. Use a text editor such as Notepad or TextEdit to edit the HTML document.

### To create a basic HTML5 document:

1. Copy the **ch1activity1.html** file from the Chapter01 folder provided with your Data Files to the Chapter01 folder in your work folder. (Create the Chapter01 folder, if necessary.)
2. In your text editor, open **ch1activity1.html** and examine the code. Notice that only the basic HTML elements are included to create the head and body sections of the document.

```
<!DOCTYPE html>
<html>
<head>
</head>
<body>
</body>
</html>
```

3. Add the `<title>` element with a title for your document and a `<meta>` element that defines the document type as shown in blue in the following code.

```
<!DOCTYPE html>
<html>
<head>
<title>Web Page Activity 1</title>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
</head>
<body>
</body>
</html>
```

4. Add an `<h1>` element with a heading for the document. The `<h1>` element must be contained within the `<body>` element.

```
<!DOCTYPE html>
<html>
<head>
<title>Web Page Activity 1</title>
<meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
</head>
```

```
<body>
<h1>The World Wide Web</h1>
</body>
</html>
```

5. Save your file, and view it in your browser. It should look like Figure 1-4.

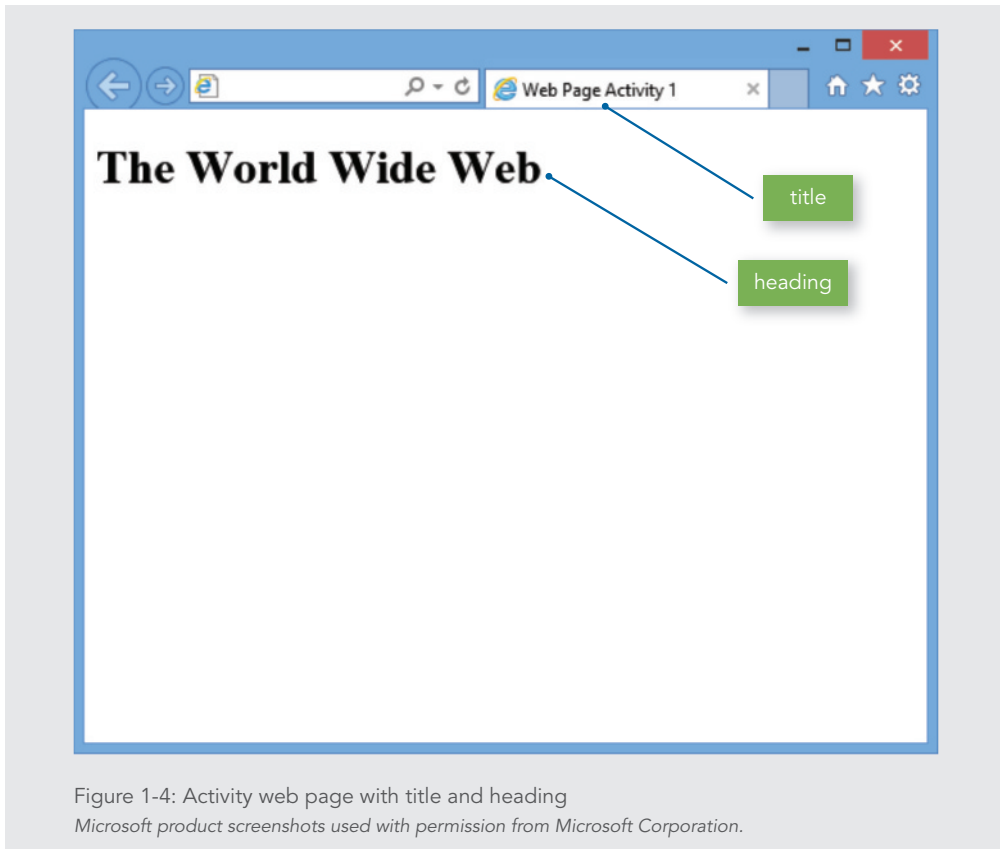


Figure 1-4: Activity web page with title and heading  
*Microsoft product screenshots used with permission from Microsoft Corporation.*

6. Add two paragraphs of content immediately following the `<h1>` element as shown.

```
<!DOCTYPE html>
<html>
<head>
<title>Web Page Activity 1</title>
<meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
</head>
```

```
<body>
<h1>The World Wide Web</h1>
<p>The World Wide Web, abbreviated as WWW and
commonly known as the web, is a system of
interlinked hypertext documents accessed via the
Internet.</p>
<p>With a web browser, one can view web pages
that may contain text, images, videos, and other
multimedia and navigate between them by using hyperlinks.</p>
</body>
</html>
```

7. Save your file, and view it in your browser. It should look like Figure 1-5.

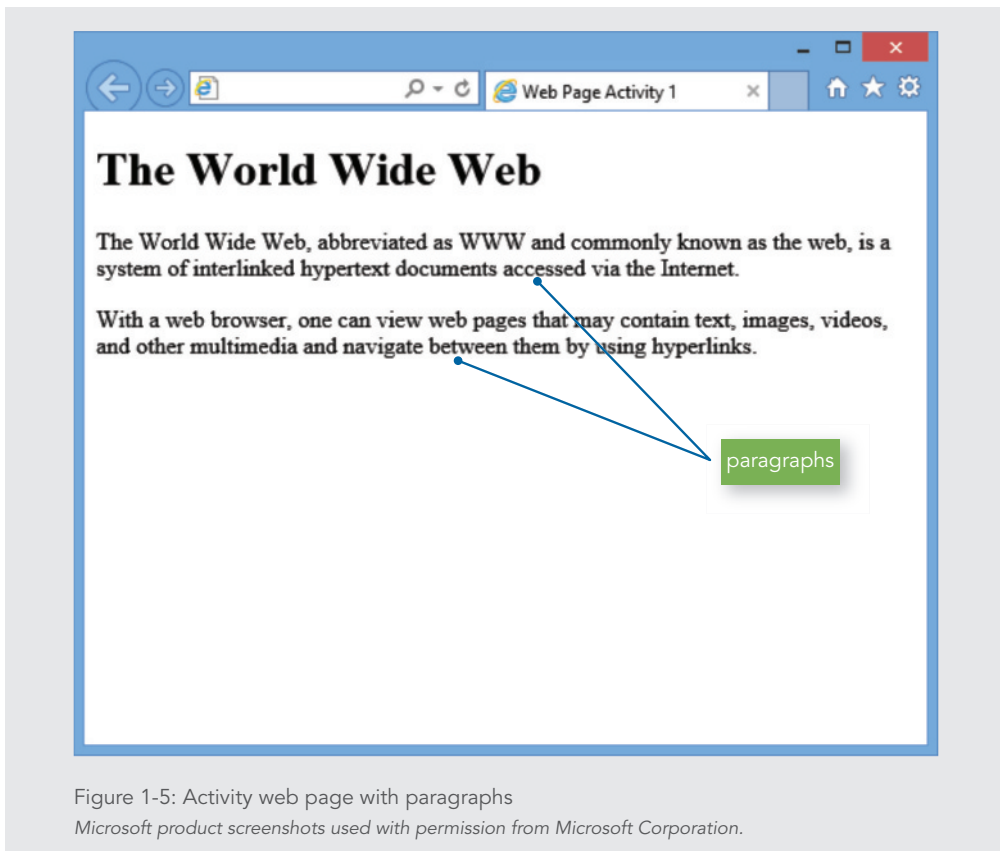


Figure 1-5: Activity web page with paragraphs  
Microsoft product screenshots used with permission from Microsoft Corporation.

**8.** Add one more paragraph and a bulleted list as shown.

```
<html>
<head>
<title>Web Page Activity 1</title>
<meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
</head>
<body>
<h1>The World Wide Web</h1>
<p>The World Wide Web, abbreviated as WWW and
commonly known as the web, is a system of
interlinked hypertext documents accessed via the
Internet.</p>
<p>With a web browser, one can view web pages
that may contain text, images, videos, and other
multimedia and navigate between them by using
hyperlinks.</p>
<p>There are many different types of web sites,
including:</p>
<ul>
<li>Social networking</li>
<li>Publishing</li>
<li>Wikis</li>
<li>Shopping and catalog</li>
<li>Search portal</li>
</ul>
</body>
</html>
```