

5

Web Design

Chapter Objectives

In this chapter, you will learn how to . . .

- Describe the most common types of website organization
- Describe the principles of visual design
- Design for your target audience
- Design clear, easy-to-use navigation
- Improve the readability of the text on your web pages
- Use graphics appropriately on web pages
- Apply the concept of universal design to web pages
- Describe web page layout design techniques
- Apply best practices of web design

As a website visitor, you have probably found that certain websites are appealing and easy to use while others seem awkward or just plain annoying. What separates the good from the bad? This chapter discusses recommended web design practices. The topics include site organization, navigation design, page layout design, text design, graphic design, choosing a color scheme, and accessibility considerations.

5.1 Design for Your Target Audience

Whatever your personal preferences, design your website to appeal to your **target audience**—the people who will use your site. Your intended target audience may be specific, such as kids, college students, young couples, or seniors, or you may intend your site to appeal to everyone. The purpose and goals of your visitors will vary—they may be casually seeking information, performing research for school or work, comparison shopping, job hunting, and so on. The design of a website should appeal to and meet the needs of the target audience.



Figure 5.1 The compelling graphic draws you in

For example, the web page shown in Figure 5.1 features compelling graphics and has a different look and feel from the text and link intensive web page displayed in Figure 5.2.

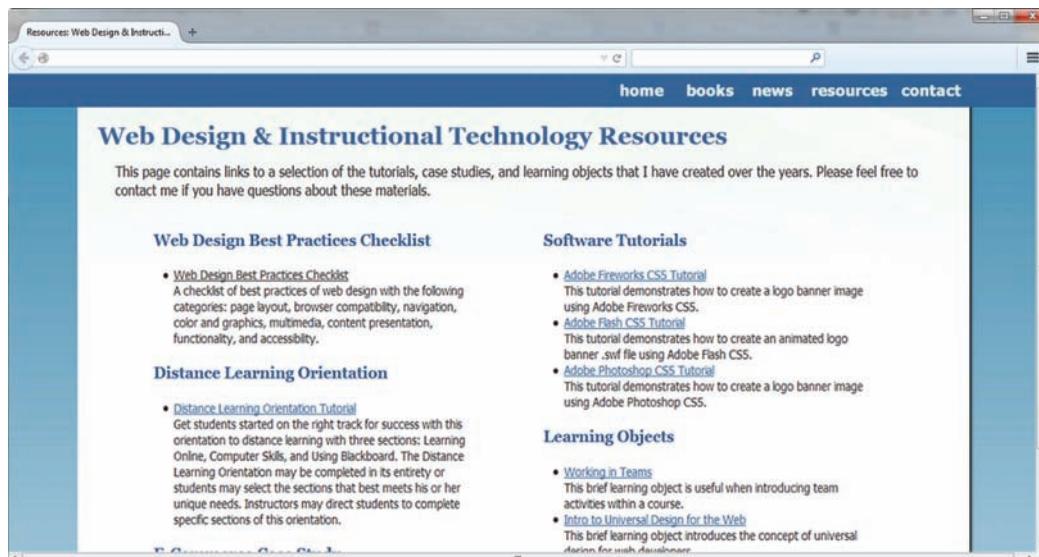


Figure 5.2 This text-intensive web page offers numerous choices

The first site engages you, draws you in, and invites exploration. The second site provides you with text-based information so that you can quickly get down to work. The layout, navigation, and even the use of color and text can work together to appeal to your target audience. Keep your target audience in mind as you explore the web design practices in this chapter.

5.2 Website Organization

How will visitors move around your site? How will they find what they need? This is largely determined by the website's organization or architecture. There are three common types of website organization:

- Hierarchical
- Linear
- Random (sometimes called Web organization)

A diagram of the organization of a website is called a **site map**. Creating the site map is one of the initial steps in developing a website (more on this in Chapter 10).

Hierarchical Organization

Most websites use **hierarchical organization**. A site map for hierarchical organization, such as the one shown in Figure 5.3, is characterized by a clearly defined home page with links to major site sections. Web pages within sections are placed as needed. The home page and the first level of pages in a hierarchical site map typically indicate the hyperlinks on the main navigation bar of each web page.

It is important to be aware of the pitfalls of hierarchical organization. Figure 5.4 shows a site design that is too shallow—there are too many major site sections.

This site design needs to be organized into fewer, easily managed topics or units of information, a process called **chunking**. In the case of web page design, each unit

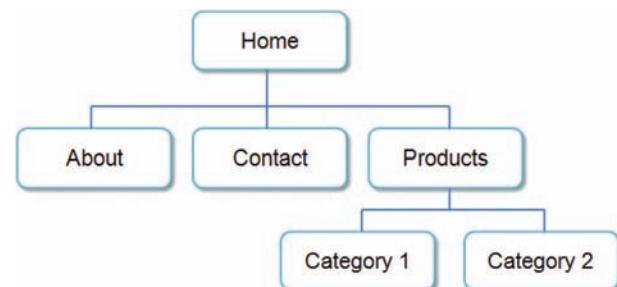


Figure 5.3 Hierarchical site organization

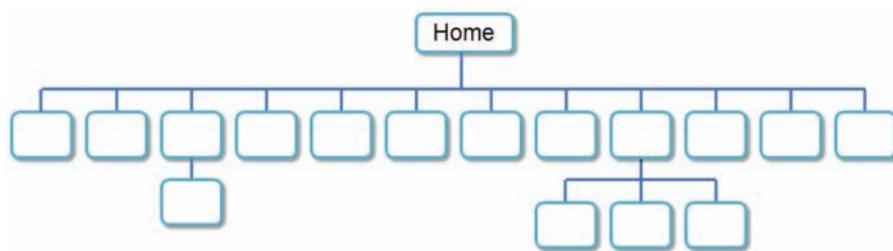


Figure 5.4 This site design uses a shallow hierarchy

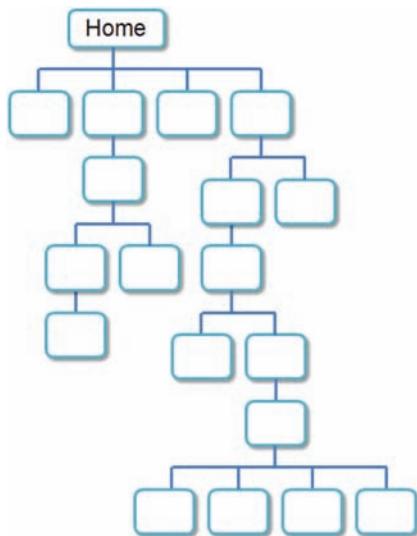


Figure 5.5 This site design uses a deep hierarchy.

of information is a page. Nelson Cowan, a research psychologist at the University of Missouri, found that adults typically can keep about four items or chunks of items (such as the three parts of a phone number 888-555-5555) in their short-term memory (<http://web.missouri.edu/~cowann/research.html>). Following this principle, be aware of the number of major navigation links and try to group them into visually separate sections on the page with each group having no more than about four links.

Another pitfall is designing a site that is too deep. Figure 5.5 shows an example of this. The interface design “three click rule” says that a web page visitor should be able to get from any page on your site to any other page on your site with a maximum of three hyperlinks. In other words, a visitor who cannot get what they want in three mouse clicks will begin to feel frustrated and may leave your site. This rule may be very difficult to satisfy on a large site, but in general, the goal is to organize your site so that your visitors can easily navigate from page to page within the site structure.

Linear Organization

When the purpose of a site or series of pages on a site is to provide a tutorial, tour, or presentation that needs to be viewed sequentially, **linear organization**, as shown in Figure 5.6, is useful.

Figure 5.6 Linear site organization

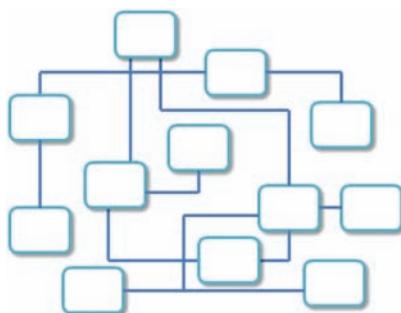
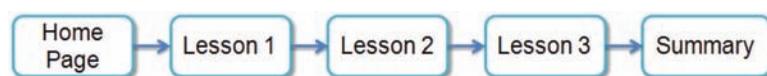


Figure 5.7 Random site organization

In linear organization, the pages are viewed one after another. Some websites use hierarchical organization in general, but with linear organization in a few small areas.

Random Organization

Random organization (sometimes called Web organization) offers no clear path through the site, as shown in Figure 5.7. There is often no clear home page and no discernable structure. Random organization is not as common as hierarchical or linear organization and is usually found only on artistic sites or sites that strive to be especially different and original. This type of organization is typically not used for commercial websites.



FAQ What's a good way to build my site map?

Sometimes it is difficult to begin creating a site map for a website. Some design teams meet in a room with a blank wall and a package of large Post-it® Notes. They write the titles of topics and subtopics needed in the site on the Post-it® Notes. They arrange the notes on the wall and discuss them until the site structure becomes clear and there is consensus within the group. If you are not working in a group, you can try this on your own and then discuss the organization of the website with a friend or fellow student.

5.3 Principles of Visual Design

There are four visual design principles that you can apply to the design of just about anything: repetition, contrast, proximity, and alignment. Whether you are designing a web page, a button, a logo, a DVD cover, a brochure, or a software interface, the design principles of repetition, contrast, proximity, and alignment will help to create the “look” (visual aesthetic), of your project and will determine whether your message is effectively communicated.



Repetition: Repeat Visual Components Throughout the Design

When applying the principle of **repetition**, the web designer repeats one or more components throughout the page. The repeating aspect ties the work together. Figure 5.8 displays the home page for a bed and breakfast business. The page design demonstrates the use of repetition in a variety of design components, including color, shape, font, and images.

- The photographs displayed on the web page use similar colors (brown, tan, dark green, and off-white) which are repeated in other areas on the web page. Browns are used for background color of the navigation area, call-to-action “Search” and “Subscribe” buttons, and the color of text in the center and right columns. An off-white color is used for the logo text, navigation text, and center column background. The dark green is used as the background color of the navigation area and also as the topic headings in the center column.
- The call-to-action “Reservations” and “Newsletter” areas have a similar shape and format with heading, content, and button.
- The use of only two font typefaces on the page also demonstrates repetition and helps to create a cohesive look. The website name and page topic headings are configured with Trebuchet font. Other page content uses Arial font.

Whether it is color, shape, font, or image, repetition helps to unify a design.

Contrast: Add Visual Excitement and Draw Attention

To apply the principle of **contrast**, emphasize the differences between page elements in order to make the design interesting and direct attention. There should be good contrast between the background color and the text color on a web page. If there is too little contrast, the text will be difficult to read. Notice how the upper right navigation area in Figure 5.8 uses a text color that has good contrast with the dark background color. The left column features a medium dark background that has good contrast with the light off-white text. The middle column features dark text on a medium-light background to provide good visual contrast and easy reading. The dark text in the footer area contrasts well with the medium-light background color.



Figure 5.8 The design principles of repetition, contrast, proximity, and alignment are applied on this web page. Screenshots of Mozilla Firefox. Courtesy of Mozilla Foundation

Proximity: Group Related Items

When designers apply the principle of **proximity**, related items are placed physically close together. Unrelated items should have space separating them. The placing of Reservations form controls close together gives visual clues to the logical organization of the information or functionality. In Figure 5.8, the horizontal navigation links are all placed in close proximity to each other. This creates a visual group on the page and makes the navigation easier to use. Proximity is used well on this page to group related elements.

Alignment: Align Elements to Create Visual Unity

Another principle that helps to create a cohesive web page is **alignment**. When applying this principle, the designer organizes the page so that each element placed has some alignment (vertical or horizontal) with another element on the page. The page shown in Figure 5.8 also applies this principle. Notice how the page components are vertically aligned in columns of equal height.

Repetition, contrast, proximity, and alignment are four visual design principles that can greatly improve your web page designs. If you apply these principles effectively, your web pages will look more professional and you will communicate your message more clearly. Keep these principles in mind as you design and build web pages.

5.4 Design to Provide Accessibility



In Chapter 1, you were introduced to the concept of universal design. Let's take a closer look in this section at how the concept of universal design can apply to web design.

Who Benefits from Universal Design and Increased Accessibility?

Consider the following scenarios:

- Maria, a young woman in her twenties with physical challenges who cannot manipulate a mouse and who uses a keyboard with much effort: Accessible web pages designed to function without a mouse will help Maria to access content.
- Leotis, a college student who is deaf and wants to be a web developer: Captions for audio/video content and transcripts will provide Leotis access to content.
- Jim, a middle-aged man who has a dial-up Internet connection and is using the Web for personal enjoyment: Alternate text for images and transcripts for multimedia will provide Jim improved access to content.
- Nadine, a mature woman with age-related macular degeneration who has difficulty reading small print: Web pages that are designed so that text can be enlarged in the browser will make it easier for Nadine to read.
- Karen, a college student using a smartphone to access the Web: Accessible content organized with headings and lists will make it easier for Karen to surf the Web on a mobile device.
- Prakesh, a man in his thirties who is legally blind and needs access to the Web in order to do his job: Web pages that are designed to be accessible (which are organized with headings and lists, display descriptive text for hyperlinks, provide alternate text descriptions for images, and are usable without a mouse) will help Prakesh to access content.

All of these individuals benefit from web pages that are designed with accessibility in mind. A web page that is designed to be accessible is typically more usable for all—even a person who has no physical challenges and is using a broadband connection benefits from the improved presentation and organization of a well-designed web page.

Accessible Design Can Benefit Search Engine Listing

Search engine programs (commonly referred to as bots or spiders) walk the Web and follow hyperlinks on websites. An accessible website with descriptive page titles that is well organized with headings, lists, descriptive text for hyperlinks, and alternate text for images is more visible to search engine robots and may result in a better ranking.

Accessibility is the Right Thing to Do

The Internet and the World Wide Web are such a pervasive part of our culture that accessibility is mandated by law in the United States. Section 508 of the Rehabilitation Act requires electronic and information technology, including web pages, used by federal agencies to be accessible to people with disabilities. At the time this was written, the Section 508 standards were undergoing revision. New proposed Section 508 requirements have been aligned to WCAG 2.0 guidelines and were released for comment in 2015. Visit <http://www.access-board.gov> for current information. The accessibility recommendations presented in this text are intended to satisfy the Section 508 standards and the **Web Content Accessibility Guidelines 2.0 (WCAG 2.0)** recommended by the W3C's **Web Accessibility Initiative (WAI)**. The following four principles are essential to conformance with WCAG 2.0: Perceivable, Operable, Understandable, and Robust, referred to by the acronym **POUR**.

1. Content must be **Perceivable**. Perceivable content is easy to see or hear. Any graphic or multimedia content should be available in a text format, such as text descriptions for images, closed captions for videos, and transcripts for audio.
2. Interface components in the content must be **Operable**. Operable content has navigation forms, or other interactive features that can be used or operated with either a mouse or a keyboard. Multimedia content should be designed to avoid flashing, which may cause a seizure.
3. Content and controls must be **Understandable**. Understandable content is easy to read, organized in a consistent manner, and provides helpful error messages when appropriate.
4. Content should be **Robust** enough to work with current and future user agents, including assistive technologies. Robust content is written to follow W3C recommendations and should be compatible with multiple operating systems, browsers, and assistive technologies such as screen reader applications.

The WCAG 2.0 Quick Reference in Appendix F contains a brief list of guidelines for designing accessible web pages. See <http://www.w3.org/TR/WCAG20/Overview> for a detailed description of the WCAG 2.0 guidelines. These guidelines are segmented into three levels of conformance: Level A, Level AA, and Level AAA. In addition to satisfying the Section 508 guidelines, the accessibility recommendations discussed in this textbook are also intended to fully satisfy the WCAG 2.0 Level AA (includes Level A) guidelines and partially satisfy the Level AAA guidelines. Visit <http://www.w3.org/WAI/WCAG20/quickref> for an interactive checklist of these guidelines. Developing accessible web pages is an important aspect of web design. The University of Toronto (<http://achecker.ca/checker/index.php>) provides a free accessibility validation service.

As you work through this book, you'll learn to include accessibility features as you create practice pages. You've already discovered the importance of the title tag, heading tags, descriptive text for hyperlinks, and alternate text for images in Chapters 2, 3, and 4. You're well on your way to creating accessible web pages!

5.5 Writing for the Web

Long-winded sentences and explanations are often found in academic textbooks and romance novels, but they really are not appropriate on a web page. Large blocks of text and long paragraphs are difficult to read on the Web. The following suggestions will help to increase the readability of your web pages.

Organize Your Content

According to web usability expert Jakob Neilsen, people don't really read web pages; they scan them. Organize the text content on your pages to be quickly scanned. Be concise. Use headings, subheadings, brief paragraphs, and unordered lists to organize web page content so that it is easy to read and visitors can quickly find what they need. See Figure 5.9 for an example of organizing web page content with headings, subheadings, and brief paragraphs.

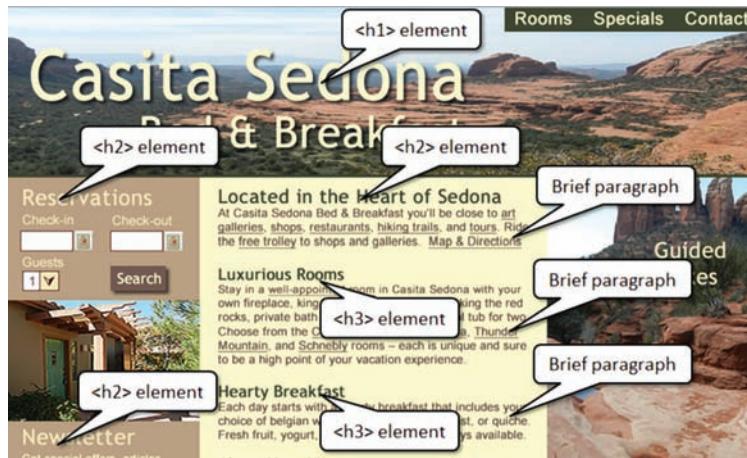


Figure 5.9 The web page content is well organized with headings

Choosing a Font

Use common font typefaces such as Arial, Verdana, Georgia, or Times New Roman. Remember that the web page visitor must have the font installed on his or her computer in order for that particular font to appear. Your page may look great with Gill Sans Ultra Bold Condensed, but if your visitor doesn't have the font, the browser's default font will be displayed. Explore the list of "browser safe fonts" at <http://www.ampsoft.net/webdesign-l/WindowsMacFonts.html>.

Serif fonts, such as Times New Roman, were originally developed for printing text on paper, not for displaying text on a computer monitor. Research shows that sans serif fonts, such as Arial and Verdana, are easier to read than serif fonts when displayed on a computer screen (see <http://alexpooke.info/blog/which-are-more-legible-serif-or-sans-serif-typefaces> or <http://www.webdesignerdepot.com/2013/03/serif-vs-sans-the-final-battle> for details).

Font Size

Be aware that fonts display smaller on a Mac than on a PC. Even within the PC platform, the default font size displayed by browsers may not be the same. Consider creating prototype pages of your font size settings to test on a variety of browsers and screen resolution settings.

Font Weight

Bold or *emphasize* important text (use the `` element for bold and the `` element to configure italics). However, be careful not to bold everything—that has the same effect as bolding nothing.

Font Color Contrast

Written content is easier to read when there is sufficient contrast between text and background color. While often you can verify sufficient color contrast by viewing a web page, the following online tools are helpful:

- <http://www.dasplankton.de/ContrastA>
- <http://juicystudio.com/services/luminositycontrastratio.php>
- http://snook.ca/technical/colour_contrast/colour.html

Line Length

Be aware of line length—use white space and multiple columns if possible. Christian Holst at the Baymard Institute (<http://baymard.com/blog/line-length-readability>) describes studies that recommend between 50 and 75 characters per line for readability.

Alignment

A paragraph of centered text is more difficult to read than left-aligned text.

Text in Hyperlinks

Hyperlink key words or descriptive phrases; do not hyperlink entire sentences. Avoid use of the words “Click here” in hyperlinks because users know what to do by now. Also, be aware that an increasing number of people are using touch screens so they’ll be selecting or tapping rather than clicking.

Reading Level

Match the reading level and style of writing to your target audience. Use vocabulary that they will be comfortable with. Juicy Studio offers a free online readability test at <http://juicystudio.com/services/readability.php>.

Spelling and Grammar

Unfortunately, many websites contain misspelled words. Most web authoring tools such as Adobe Dreamweaver have built-in spell checkers; consider using this feature. Finally, be sure that you proofread and test your site thoroughly. It’s very helpful if you can find web developer buddies—you check their sites and they check yours. It’s always easier to see someone else’s mistake than your own.

5.6 Use of Color

You may be wondering how to select colors to display on web pages. The right color scheme can attract and engage your website visitors while a garish color scheme can drive them away. This section introduces several methods for choosing a color scheme.

Color Scheme Based on an Image

One of the easiest ways to select a color scheme for your website is to start with an existing graphic image, such as a logo or a photograph of nature. If the organization already has a logo, select colors from the logo for use as the basis of your color scheme. Another option is to use a photograph that captures the mood of the website—you can create a color scheme using colors found in the image.

Figure 5.10 shows a photograph along with two potential color schemes created by selecting colors from the image. If you are comfortable using a graphic application (such as Adobe Photoshop, GIMP, or <http://pixlr.com/editor>), you can use the color picker tool within the application to determine the colors used in an image. There are also several websites that will generate a color scheme based on a photograph, including

- <http://www.degraeve.com/color-palette/index.php>
- <http://bighugelabs.com/colors.php>
- <http://www.cssdrive.com/imagepalette>
- <http://www.pictaculous.com>

Even if you use an existing graphic as the basis for a color scheme, it's helpful to have a working knowledge of **color theory**, the study of color and its use in design. Let's explore color theory and the color wheel.

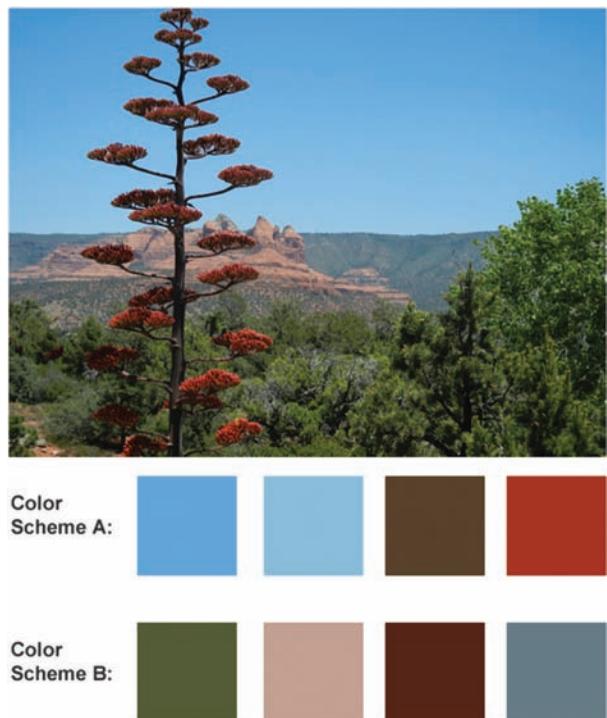


Figure 5.10 A color scheme selected from a photo

Color Wheel

A **color wheel** (see Figure 5.11) is a circle of color depicting the primary colors (red, yellow, and blue), the secondary colors (orange, violet, and green), and the tertiary colors (yellow-orange, red-orange, red-violet, violet-blue, blue-green, and yellow-green). There is no need to restrict your choices to the web-safe color palette.

Shades, Tints, and Tones

Modern monitors can display millions of colors. Feel free to choose a shade, tint, or tone of a color. Figure 5.12 shows four swatches: yellow, a shade of yellow, a tint of yellow, and a tone of yellow. A **shade** of a color is darker than the original color and is created by mixing the color with black. A **tint** of a color is lighter than the original color and is created by mixing color with white. A **tone** of a color has less saturation than the original color and is created by mixing the color with gray.

Next, let's explore the six commonly used types of color schemes: monochromatic, analogous, complementary, split complementary, triadic, and tetradiic.



Figure 5.11 Color wheel



Figure 5.12 Yellow with a shade, tint, and tone

Color Scheme Based on the Color Wheel

Monochromatic Color Scheme

Figure 5.13 shows a **monochromatic color scheme** which consists of shades, tints, or tones of the same color. You can determine these values yourself, or use an online tool provided by one of the following resources:



Figure 5.13 Monochromatic color scheme

- <http://meyerweb.com/eric/tools/color-blend>
- <http://www.colorsontheweb.com/colorwizard.asp> (choose a color and select monochromatic)
- <http://paletton.com> (choose a color and select monochromatic)



Figure 5.14 Analogous color scheme

Analogous Color Scheme

To create an **analogous color scheme**, select a main color and the two colors that are adjacent to it on the color wheel. Figure 5.14 displays an analogous color scheme with orange, red-orange, and yellow-orange. When you design a web page with an analogous color scheme, the main color is the most dominant on the web page. The adjacent colors are typically configured as accents.



Figure 5.15 Complementary color scheme

Complementary Color Scheme

A **complementary color scheme** consists of two colors that are opposite each other on the color wheel. Figure 5.15 displays a complementary color scheme with yellow and violet. When you design a web page with a complementary color scheme, choose one color to be the main or dominant color. The other color is considered to be the **complement**. Configure the complement along with colors adjacent to the dominant color as accents.



Figure 5.16 Split complementary color scheme

Split Complementary Color Scheme

A **split complementary color scheme** is comprised of a main color, the color opposite it on the color wheel (the complement), and two colors adjacent to the complement. Figure 5.16 shows a split complementary color scheme with yellow (main), violet (complementary), red-violet, and blue-violet.



Figure 5.17 Triadic color scheme

Triadic Color Scheme

Choose three colors that are equidistant on the color wheel to create a **triadic color scheme**. Figure 5.17 displays a triadic color scheme with blue-green (teal), yellow-orange, and red-violet.



Figure 5.18 Tetradic color scheme

Tetradic Color Scheme

Figure 5.18 shows a **tetradic color scheme**, which consists of four colors that are two complementary pairs. For example, the complementary pair yellow and violet along with the complementary pair yellow-green and red-violet make up a tetradic color scheme.

Implementing a Color Scheme

When designing a web page with a color scheme, one color is typically dominant. The other colors are configured as accents such as colors for headings, subheadings, borders, list markers, and backgrounds. No matter what your color scheme, you will typically also use neutral colors such as white, off-white, gray, black, or brown. Ensure that the colors you choose for text and background have good contrast. Selecting the best color scheme for your website often takes some trial and error. Feel free to use tints, shades, or tones of the primary, secondary, and tertiary colors. There are so many colors to choose from! The following resources can help you choose a color scheme for your website:

- <http://paletton.com>
- <http://www.colorsontheweb.com/colorwizard.asp>
- <http://www.leestreet.com/QuickColor.swf>
- <http://color.adobe.com>
- <http://www.colorsphere.com>
- <http://colrd.com>
- <http://hslpicker.com>

Accessibility and Color

While color can help you create a compelling web page, keep in mind that not all of your visitors will see or be able to distinguish between colors. Some visitors will use a screen reader and will not experience your colors, so your information must be clearly conveyed even if the colors cannot be viewed.

Your color choices can be crucial. For example, red text on a blue background, as shown in Figure 5.19, is usually difficult for everyone to read. Also avoid using a red and green color scheme or a brown and purple color scheme because individuals with color-deficient vision may have difficulty differentiating the colors. According to Color Blindness Awareness (<http://www.colourblindawareness.org/>), 1 in 12 men and 1 in 200 women experience some type color blindness. Visit <http://colorfilter.wickline.org> to simulate how a person with a color deficiency experiences the colors on a web page. White, black, and shades of blue and yellow are easier for most people to discern.



Can you read this easily?

Figure 5.19
Some color combinations are difficult to read

Choose background and text colors with a high amount of contrast. The WCAG 2.0 guidelines recommend a contrast ratio of 4.5:1 for standard text. If the text has a large font, the contrast ratio can be as low as 3:1. Jonathan Snook's online Colour Contrast Check at http://snook.ca/technical/colour_contrast/colour.html can help you to verify the contrast level of your text and background colors.

See Lighthouse International's website (<http://lighthouse.org/accessibility/design/accessible-print-design/effective-color-contrast>) for more information on the effective use of color. When choosing color, it's important to consider the preferences of your target audience. The next sections focus on this aspect of web design.

Colors and Your Target Audience

Choose colors that will appeal to your target audience. Younger audiences, such as children and preteens, prefer bright, lively colors. The web page shown in Figure 5.20, features bright graphics, lots of color, and interactivity. Examples of websites designed to appeal to children are <http://www.sesamestreet.org/games>, <http://www.nick.com>, and <http://www.usmint.gov/kids>.



Figure 5.20 A web page intended to appeal to children

Individuals in their late teens and early twenties generally prefer dark background colors with occasional use of bright contrast, music, and dynamic navigation. Figure 5.21 shows a web page designed for this age group. Note how it has a completely different look and feel from the site designed for young children. Examples of websites designed to appeal to young adults are <http://us.battle.net/wow>, <http://www.nin.com>, and <http://www.thresholdrpg.com>.



Figure 5.21 Many teens and young adults find dark sites appealing

If your goal is to appeal to everyone, follow the example of the popular Amazon.com and eBay.com websites in their use of color. These sites display a neutral white background with splashes of color to add interest and highlight page areas. Use of white as a background color was found to be quite popular by Jakob Nielsen and Marie Tahir in *Homepage Usability: 50 Websites Deconstructed*, a book that analyzed 50 top websites. According to this study, 84% of the sites used white as the background color, and 72% used black as the text color. This maximized the contrast between text and background—providing maximum ease of reading.

You'll also notice that websites targeting "everyone" often include compelling visual graphics. The web page shown in Figure 5.22 provides the text content on a white background for maximum contrast while engaging the visitor with a large graphic, called a **hero**, intended to grab attention and entice the visitor to want to explore the website.

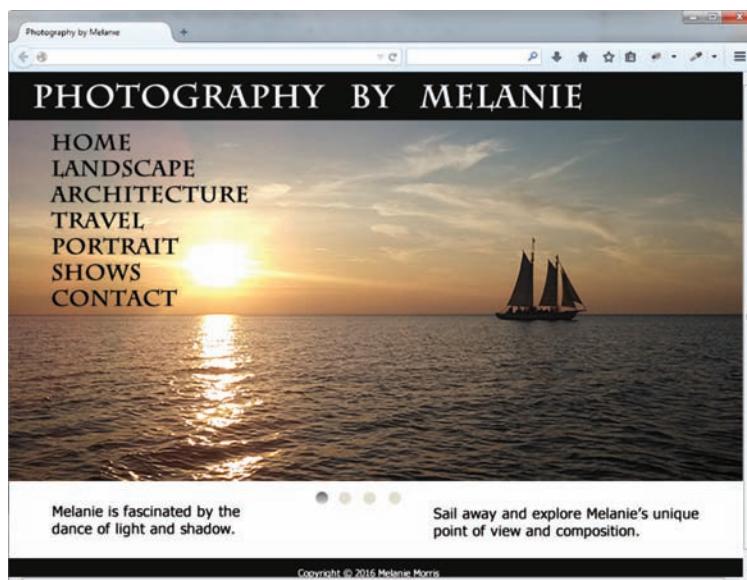


Figure 5.22 A compelling graphic along with white background for the content area

For an older target audience, light backgrounds, well-defined images, and large text are appropriate. The web page shown in Figure 5.23 is an example of a web page intended for the 55 and older age group. Examples of websites designed to appeal to older adults are <http://www.aarp.org>, <http://www.theseniornews.com>, and <http://senior.org>.

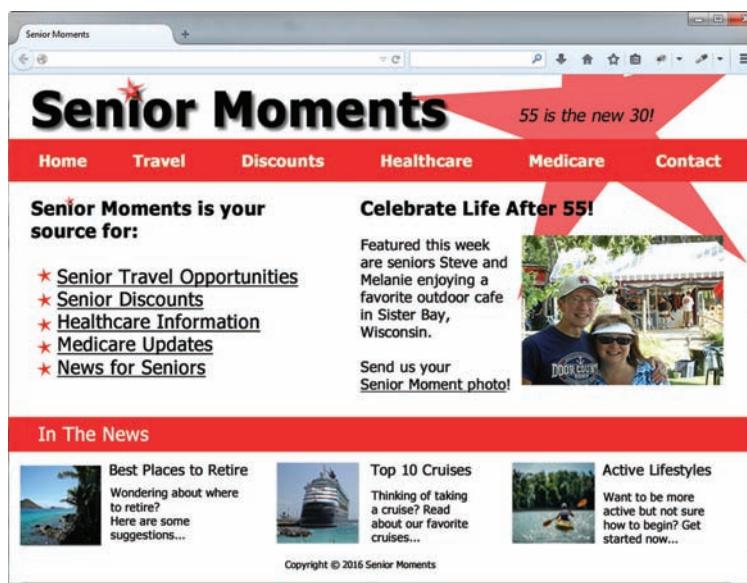


Figure 5.23 A site designed specifically for the 55 and older age group



Checkpoint 5.1

1. List the four basic principles of design. View the home page of your school and describe how each principle is applied.
2. List three best practices used when writing text for the Web. The following text was found on an actual website. The company name and city have been changed. Apply the best practices used when writing for the Web and rewrite the following content:

Acme, Inc. is a new laboratory instrument repair and service company. Our staff at this time has a combined total of 30 plus years of specimen preparation instrumentation service and repair.

Our technicians are EPA refrigeration certified. We are fully insured and all of our workers are fully covered by workman's compensation insurance. A proof of insurance certificate can be provided upon request.

We are located in Chicago, Illinois. Which houses shop repair facilities and offices. Acme, Inc. technicians are factory trained and equipped with the best diagnostic and repair equipment available.

We keep a separate file on every piece of equipment we work on. When a technician is sent on a repair, he has a file which lists the whole repair history on that piece of equipment. These files also help us answer any of your questions about past repairs.

Our rates are \$100.00 per hour for Labor and Travel with a 2 hour minimum. \$0.40 per mile and all related expenses PARTS are not included.

3. View the following three websites: <http://www.walmart.com>, <http://willyporter.com>, and Sesame Street (<http://www.sesamestreet.org/muppet>). Describe the target audience for each site. How do their designs differ? How are their designs similar? Do the sites meet the needs of their target audiences?

5.7 Use of Graphics and Multimedia

As shown in Figure 5.1, a compelling graphic can be an engaging element on a web page. However, avoid relying on images to convey meaning. Some individuals may not be able to see your images and multimedia—they may be accessing your site with a mobile device or using an assistive technology such as a screen reader to visit your page. You may need to include text descriptions of important concepts or key points that a graphic image or multimedia file conveys. In this section, you'll explore recommended techniques for the use of graphics and multimedia on web pages.

File Size and Image Dimensions Matter

Keep both the file size and the dimensions of images as small as possible. Try to display only exactly what is needed to get your point across. Use a graphic application to crop an image or create a thumbnail image that links to a larger version of the image.

Antialiased/Aliased Text in Media

Antialiasing introduces intermediate colors to smooth jagged edges in digital images. Graphic applications such as Adobe Photoshop and Adobe Fireworks can be used to create antialiased text images. The graphic shown in Figure 5.24 was created using

antialiasing. Figure 5.25 displays an image created without antialiasing; notice the jagged edges.

Use Only Necessary Multimedia

Use animation and multimedia only if it will add value to your site.

Don't include an animated GIF or a Flash animation (see Chapter 11) just because you have one. Limit the use of animated items. Only use animation if it makes the page more effective. Consider limiting how long an animation plays.

In general, younger audiences find animation more appealing than older audiences. The web page shown in Figure 5.20 is intended for children and uses lots of animation. This would be too much animation for a website targeted to adult shoppers. However, a well-done navigation animation or an animation that describes a product or service could be appealing to almost any target group. Adobe Flash is used on the Web to add visual interest and interactivity to web pages. In Chapter 11 you'll work with Flash animation and with new CSS3 properties that add animation and interactivity to web pages.

Antialiased

Figure 5.24 Antialiased text



Figure 5.25 This graphic was not antialiased: The letter "A" has a jagged look

Provide Alternate Text

As discussed in Chapter 4, each image on your web page should be configured with alternate text. Alternate text may be displayed by mobile devices, displayed briefly when an image is slow to load, and displayed when a browser is configured to not show images. Alternate text is also read aloud when a person with a disability uses a screen reader to access your website.

To satisfy accessibility requirements, also provide alternate text equivalents for multimedia, such as video and audio. A text transcript of an audio recording can be useful not only to those with hearing challenges, but also to individuals who prefer to read when accessing new information. In addition, the text transcript may be accessed by a search engine and used when your site is categorized and indexed. Captions help to provide accessibility for video files. See Chapter 11 for more on accessibility and multimedia.



Focus on
Accessibility

5.8 More Design Considerations

Load Time

The last thing you want to happen is for your visitors to leave your page before it has even finished loading! Make sure your pages load as quickly as possible. Web usability expert Jakob Nielsen reports that visitors will often leave a page after waiting more than 10 seconds. It takes just less than 9 seconds at 56Kbps for a browser to display a web page and associated files of 60KB. It's a good practice to try to limit the total file size of a website's home page and all of its associated images and media files to less than 60KB. However, it's common to go over this recommended limit for content pages when you're sure that your visitors will be interested enough to wait to see what your site is presenting.

According to a recent study by the PEW Research Center's Internet and American Life Project, the percentage of U.S. Internet users with a broadband (cable, DSL, and so

on) connection at home or at work is rising. Seventy percent of adult Americans have access to broadband at home. Even with the trend of increasing bandwidth available to your visitors, keep in mind that 30% of households do not have broadband Internet access. Visit Pew Internet (<http://www.pewinternet.org>) for the most up-to-date statistics. The chart shown in Figure 5.26 compares file sizes and connection speed download times.

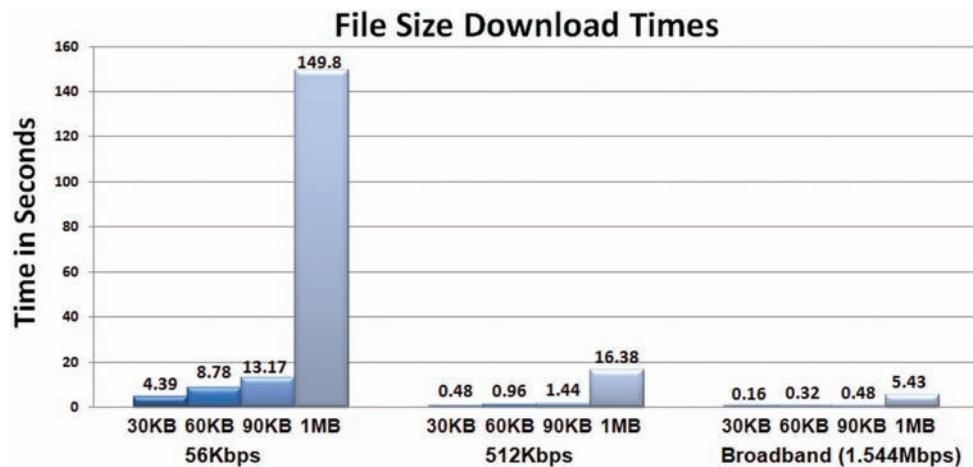


Figure 5.26 File size download times and Internet connection speeds

One method to help determine whether the **load time** of your page is acceptable is to view the size of your website files in Windows Explorer or Mac Finder. Calculate the total file size of your web page plus all of its associated images and media. If the total file size for a single page and its associated files is more than 60KB and it is likely that your target audience may not be using broadband access, take a closer look at your design. Consider whether you really need to use all of the images to convey your message. The **perceived load time** is the amount of time that a web page visitor is aware of waiting while your page is loading. Because visitors often leave a website if a page takes too long to load, it is important to shorten their perception of waiting. A common technique is to shorten the perceived loading time by optimizing images, using CSS Sprites (see Chapter 7), and breaking a long page into multiple smaller pages. Popular web authoring tools such as Adobe Dreamweaver will calculate load time at various transmission speeds.

Above the Fold

Placing important information **above the fold** is a technique borrowed from the newspaper industry. When newspapers are placed on counters and in vending machines to be sold, the portion above the fold on the page is viewable. Publishers noticed that more papers were sold when the most important, attention-getting information was placed in this location. You may use this technique to attract visitors to your web pages and to keep them there. At a popular screen resolution of 1024 × 768, the amount of screen viewable above the fold (after accounting for browser menus and controls) is about 600 pixels. Avoid placing important information and navigation on the far right side because this area may not be initially displayed by browsers at some screen resolutions.

White Space

This term **white space** is also borrowed from the publishing industry. Placing blank or white space (because paper is usually white) in areas around blocks of text increases the readability of the page. Placing white space around graphics helps them to stand out. Allow for some blank space between blocks of text and images. How much is adequate? It depends—experiment until the page is likely to look appealing to your target audience.

Avoid Horizontal Scrolling

In order to make it easy for visitors to view and use your web pages, avoid creating pages that are too wide to be displayed in the browser window. These pages require the user to scroll horizontally. Currently, a popular screen resolution is 1024 × 768. Cameron Moll (<http://www.cameronmoll.com/archives/001220.html>) suggests that the optimal web page width for display at 1024 × 768 screen resolution is 960 pixels. Be mindful that not all of your web page visitors will maximize their browser viewport.

Browsers

Unless you are designing for an intranet within an organization, expect your website to be visited using a wide variety of browsers. Just because your web page looks great in your favorite browser doesn't automatically mean that all browsers will render it well. A recent survey by Net Market Share (<http://www.netmarketshare.com/>) indicates that while Microsoft Internet Explorer is still the most popular web browser, the Firefox browser and the Google Chrome browsers have been gaining ground. The survey reports that about 54% of website visitors use Internet Explorer, 27% use Chrome, 12% use Firefox, and 5% use Safari. The market share of the top four mobile/tablet browsers was reported by Net Market Share: Safari (42%), Chrome (32%), Android Browser (14%), and Opera Mini (7%).

Apply the principle of **progressive enhancement**. Design the site so that it looks good in browsers commonly used by your target audience and then add enhancements with CSS3 and/or HTML5 for display in modern browsers. Always try to test your pages with the most popular versions of browsers on desktop PC and Mac operating systems. Many web page components, including default text size and default margin size, are different among browsers, browser versions, and operating systems. Also try to test your site on other types of devices such as tablets and smartphones.

Screen Resolution

Your website visitors will use a variety of **screen resolutions**. A recent survey by Net Market Share (<http://marketshare.hitslink.com/report.aspx?qprid=17>) reported the use of more than 90 different screen resolutions, with the top four being 1366 × 768 (with 16%), 1920 × 1080 (8%), 1024 × 768 (7%), and 1280 × 800 (7%). Mobile use will vary with the purpose of the website, but it is expected to grow as the use of smartphones and tablets increases. Be aware that some smartphones have low screen resolution, such as 240 × 320, 320 × 480, or 480 × 800. Popular tablet devices offer a higher screen resolution: Apple iPad mini (1024 × 768), Apple iPad Air (2048 × 1536), Samsung Galaxy Tab (1280 × 800), and Kindle Fire (1024 × 600). In Chapter 7, you'll explore CSS media queries, which is a technique for configuring a web page to display well on various screen resolutions.

5.9 Navigation Design

Ease of Navigation

Sometimes web developers are so close to their sites that they can't see the forest for the trees. A new visitor will wander onto the site and not know what to click or how to find the information he or she seeks. Clearly labeled navigation on each page is helpful. For maximum usability, the navigation should be in the same location on each page.

Navigation Bars

Clear **navigation bars**, either graphic or text based, make it obvious to website users where they are and where they can go next. It's quite common for site-wide navigation to be located either in a horizontal navigation bar placed under the logo (see Figure 5.27) or in a vertical navigation bar on the left side of the page (see Figure 5.28). Less common is a vertical navigation bar on the right side of the page because this area can be cut off at lower screen resolutions.



Figure 5.27 Horizontal text-based navigation

Breadcrumb Navigation

Jakob Nielsen, a well-known usability and web design professional, favors what he calls a **breadcrumb trail** for larger sites, which indicates the path of web pages a visitor has viewed during the current session. Figure 5.28 shows a page with a vertical navigation area in addition to the breadcrumb trail navigation above the main content area that indicates the pages the visitor has viewed during this visit: Home > Tours > Half-Day Tours > Europe Lake Tour. Visitors can easily retrace their steps or jump back to a previously viewed page. This page demonstrates that a website may use more than one type of navigation.



Figure 5.28 Visitors can follow the “breadcrumbs” to replace their steps

Using Graphics for Navigation

Sometimes graphics are used instead of text to provide navigation, as in the pink navigation buttons on the web page shown in Figure 5.20. The “text” for the navigation is actually stored in image files. Be aware that using graphics for navigation is an outdated design technique—the more modern approach is to configure text navigation with CSS background images. A website with text navigation is more accessible and more easily indexed by search engines. Even when image hyperlinks instead of text hyperlinks provide the main navigation for the site, you can use two techniques that provide for accessibility:

- Configure each image with an alternate text description.
- Configure text hyperlinks in the footer section.

Skip Repetitive Navigation

Provide a method to skip repetitive navigation links. It is easy for visitors without vision and mobility challenges to scan a web page and quickly focus on the page content. However, long, repetitive navigation bars quickly become tedious to access when utilizing a screen reader or a keyboard to visit a web page. Consider adding a “Skip navigation” or “**Skip to content**” hyperlink before your main navigation bar that links to a named fragment (see Chapter 7) at the beginning of the content section of your page. Figure 5.29 presents another way to implement the skip navigation feature. Although not immediately visible in the browser, visitors using a screen reader or a keyboard to tab through the page will immediately encounter the “Skip to content” hyperlink near the top of the web page at <http://webdevbasics.net>.



Figure 5.29 Press the tab key to access the “Skip to content” link for this web page

Dynamic Navigation

In your experiences visiting websites you’ve probably encountered navigation menus that display additional options when your mouse cursor moves over an item. This is dynamic navigation, which provides a way to offer many choices to visitors while at the same time avoid overwhelming

them. Instead of showing all the navigation links all the time, menu items are dynamically displayed (typically using a combination of HTML and CSS) as appropriate. The additional items are made available when a related top-level menu item has focus or is selected. In Figure 5.30, “Tours” has been selected, causing the vertical menu to appear.



Figure 5.30 Dynamic navigation with HTML and CSS

Site Map

Even with clear and consistent navigation, visitors sometimes may lose their way on large websites. A site map, also referred to as a site index, provides an outline of the organization of the website with hyperlinks to each major page. This can help visitors find another route to get to the information they seek, as shown Figure 5.31.



Figure 5.31 This large site offers a site search and a site map to visitors

Site Search Feature

Note the search feature on the right side of the web page in Figure 5.31. This **site search** feature helps visitors to find information that is not apparent from the navigation or the site map.

5.10 Page Layout Design

Wireframes and Page Layout

A **wireframe** is a sketch or diagram of a web page that shows the structure (but not the detailed design) of basic page elements such as the header, navigation, content area, and footer. Wireframes are used as part of the design process to experiment with various **page layouts**, develop the structure and navigation of the site, and provide a basis for communication among project members. Note that the exact content (text, images, logo, and navigation) does not need to be placed in the wireframe diagram—the wireframe depicts the overall structure of the page.

Figures 5.32, 5.33, and 5.34 show wireframe diagrams of three possible page designs with horizontal navigation. The wireframe in Figure 5.32 is adequate and may be appropriate for when the emphasis is on text information content, but it's not very engaging.

Figure 5.33 shows a diagram of a web page containing similar content formatted in three columns along with an image. This is an improvement, but something is still missing.

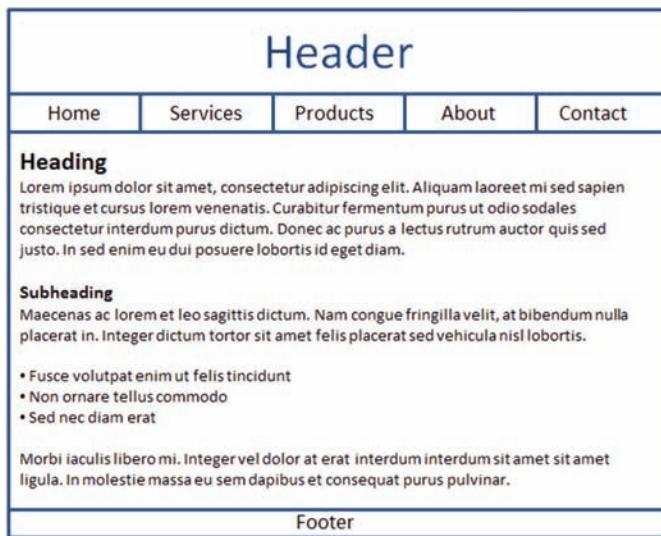


Figure 5.32 An adequate page layout

Figure 5.34 shows a diagram of the same content but formatted in three columns of varying width with a header area, navigation area, content area (with headings, subheadings, paragraphs, and unordered lists), and a footer area. This is the most appealing layout of the three. Notice how the use of columns and images in Figures 5.33 and 5.34 increase the appeal of the page.

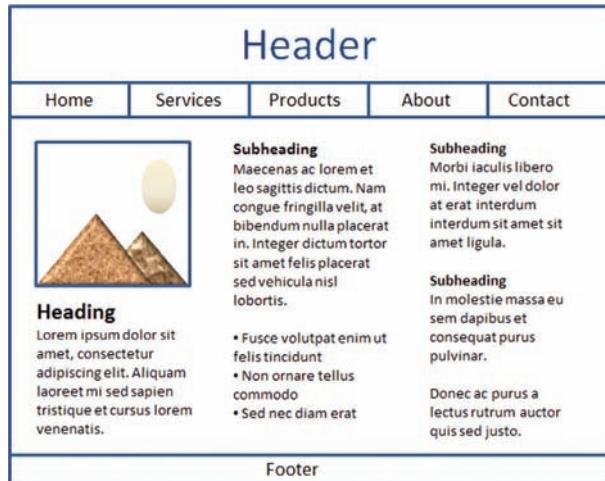


Figure 5.33 The image and columns make this page layout more interesting

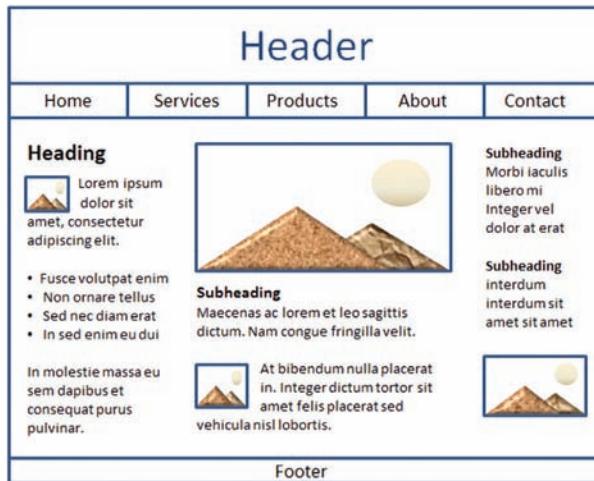


Figure 5.34 This wireframe page layout uses images and columns of various widths

The wireframe in Figure 5.35 displays a webpage with a header, vertical navigation area, content area (with headings, subheadings, images, paragraphs, and unordered lists), and a footer area.

Often the page layout for the home page is different from the page layout used for the content pages. Even in this situation, a consistent logo header, navigation, and color scheme will produce a more cohesive website. You'll learn to use Cascading Style Sheets (CSS) along with HTML to configure color, text, and layout as you work through this book. In the next section you will explore two commonly used layout design techniques: fixed layout and fluid layout.

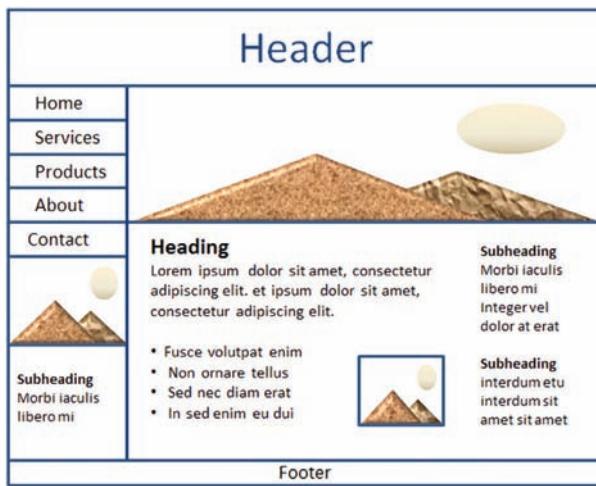


Figure 5.35 Wireframe with vertical navigation

Page Layout Design Techniques

Now that you have been introduced to wireframes as a way to sketch page layout, let's explore two commonly used design techniques to implement those wireframes: fixed layout and fluid layout.

Fixed Layout

The **fixed layout** technique is sometimes referred to as a solid or “ice” design. The web page content has a fixed width and may hug the left margin as shown in Figure 5.36.

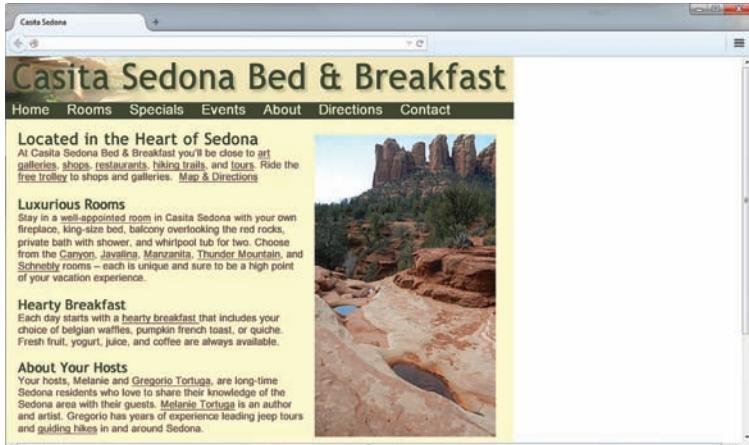


Figure 5.36 This page is configured with a fixed layout design

Notice the empty space in the right side of the browser viewport in Figure 5.36. To avoid this unbalanced look, a popular method to create a fixed layout design is to configure the content with a specific width in pixels (such as 960px) and center it in the browser viewport as shown in Figure 5.37. As the browser is resized, it will expand or contract the left and right margin areas to center the content in the viewport.

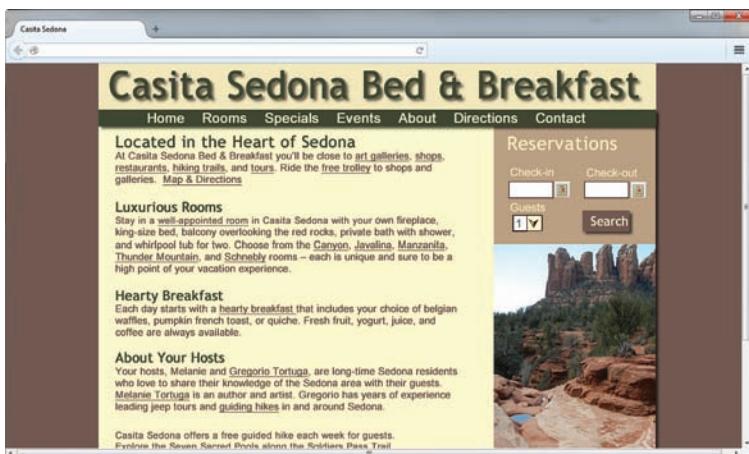


Figure 5.37 This fixed width centered content is balanced on the page by left and right margins

Fluid Layout

The **fluid layout** technique, sometimes referred to as a “liquid” layout, results in a fluid web page with content typically configured with percentage values for widths—often taking up 100% of the browser viewport. The content will flow to fill whatever size browser window is used to display it, as shown in Figure 5.38. Other examples of liquid layout can be found at <http://amazon.com> and <http://sears.com>. One disadvantage of liquid layout is that when displayed in maximized browser viewports using high screen resolutions the lines of text may be quite wide and become difficult to scan and read.

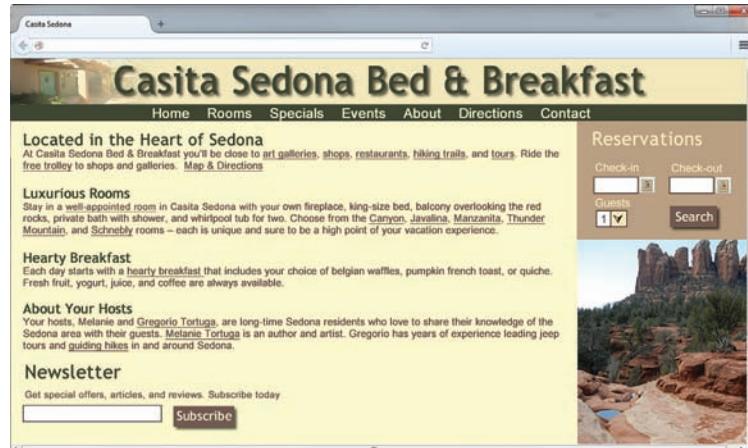


Figure 5.38 This fluid layout expands to fill 100% of the browser viewport

Figure 5.39 shows an adaptation of liquid layout that utilizes a 100% width for the header and navigation area along with an 80% width for the centered page content. Compare this to Figure 5.38. The centered content area grows and shrinks as the browser viewport is resized. Readability can be ensured by using CSS to configure a maximum width value for this area.



Figure 5.39 This fluid layout also has a maximum width value configured for the centered content area

Websites designed using fixed and fluid layout techniques can be found throughout the Web. Fixed-width layouts provide the web developer with the most control over the page configuration but can result in pages with large empty areas when viewed at higher screen resolutions. Fluid designs may become less readable when viewed at high screen resolutions due to the page stretching to fill a wider area than originally intended by the developer. Configuring a maximum width on text content areas can alleviate the text readability issues. Even when using an overall fluid layout, portions of the design can be configured with a fixed width (such as the “Reservations” column on the right side of the web page in Figures 5.38 and 5.39). Whether employing a fixed or fluid layout, web pages with centered content are typically pleasing to view on a variety of desktop screen resolutions.

5.11 Design for the Mobile Web

The desktop browser is not the only way that people access websites. Access to the Web from cell phones, smartphones, and tablets makes it possible to always be online. A PEW Research Center study reported that 63% of all Americans use a mobile phone to go online (<http://www.pewinternet.org/fact-sheets/mobile-technology-fact-sheet>). Visit <http://mashable.com/2012/08/22/mobile-trends-e-commerce> for an infographic about trends in mobile device usage. With this growth in mind, it's becoming more important to design web pages that are appealing and usable for your mobile visitors.

Three Approaches

There are three different approaches to providing a satisfactory mobile experience for your website visitor:

1. Develop a separate mobile site with a .mobi TLD (see Chapter 1 to review TLDs). Visit ebay at <http://ebay.mobi> using a smartphone or tablet to see this in practice.
2. Create a separate website hosted within your current domain that is targeted for mobile users. Visit <http://www.whitehouse.gov> with the mobile version at <http://m.whitehouse.gov> to see this approach in action.
3. Apply techniques of responsive web design (see the next section) by using CSS to configure your current website for display on mobile devices.

Mobile Device Design Considerations

No matter which approach you choose to use, here are some considerations to keep in mind when designing a mobile website.

- **Small screen size.** Common mobile phone screen sizes include 320 × 480, 480 × 800, 640 × 960, 640 × 1136, and 750 × 1334. Even on one of the large phones, that's not a lot of pixels to work with!
- **Low bandwidth (slow connection speed).** Although the use of faster 4G networks is becoming more widespread, many mobile users experience slow connection speeds. Images usually take up quite a bit of bandwidth on a typical website. Depending on the service plan, some mobile web visitors may be paying per kilobyte. Be aware of this and eliminate unnecessary images.
- **Font, color, and media issues.** Mobile devices may have very limited font support. Configure font size using ems or percentages and configure generic font family names. Some older mobile devices may have very limited color support. Choose colors carefully to maximize contrast. Many mobile devices do not support Adobe Flash media.
- **Awkward controls; limited processor and memory.** While smartphones with touch controls are becoming more popular, many mobile users will not have access to mouselike controls. Provide keyboard access to assist these users. Although mobile device processing speed and available memory are improving, they still cannot compare to the resources of a desktop computer. While this won't be an issue for the websites you create for the exercises in this text, be mindful of this issue in the future as you continue to develop your skills and create web applications.
- **Functionality.** Provide easy access to your website's features with prominent hyperlinks or a prominent search button.

Example Desktop Website and Mobile Website

The website shown in Figures 5.40 and 5.41 utilizes the second approach—separate websites within the same domain for desktop display and mobile display.

The desktop site shown in Figure 5.40 features a large graphic and interactive slideshow.



Figure 5.40 The website in a desktop browser



Figure 5.41 A mobile version of the website

The mobile site shown in Figure 5.41 features a prominent navigation area, phone number, and small background image.

Mobile Design Quick Checklist

- Be aware of the small screen size and bandwidth issues.
- Configure nonessential content, such as sidebar content, to not display.
- Consider replacing desktop background images with graphics optimized for small screen display.
- Provide descriptive alternate text for images.
- Use a single-column layout for mobile display.
- Choose colors to maximize contrast.

Responsive Web Design

As mentioned earlier in this chapter, a recent survey by Net Market Share reported the use of more than 90 different screen resolutions and that websites are expected to display and function well on desktop browsers, tablets, and smartphones. While you

can develop separate desktop and mobile websites, a more streamlined approach is to utilize the same website for all devices. The W3C's **One Web** initiative refers to the concept of providing a single resource that is configured for optimal display on multiple types of devices.

Responsive web design is a term coined by noted web developer Ethan Marcotte (<http://alistapart.com/article/responsive-web-design>) to describe progressively enhancing a web page for different viewing contexts (such as smartphones and tablets) through the use of coding techniques, including fluid layouts, flexible images, and media queries. In Chapter 7, you'll learn to configure flexible images and code CSS **media queries**, which is a technique for configuring a web page to display well at various screen resolutions.

Visit the Media Queries website (<http://mediaqueri.es>) to view a gallery of sites that demonstrate this method for responsive web design. The screen captures in the Media Queries gallery show web pages at the following screen widths: 320px (smartphone display), 768px (tablet portrait display), 1024px (netbook display and landscape tablet display), and 1600px (large desktop display).

You might be surprised to discover that Figures 5.42, 5.43, 5.44, and 5.45 are actually the same web page .html file that is configured with CSS to display differently, depending on the viewport size detected by media queries. Figure 5.42 shows the standard desktop browser display.

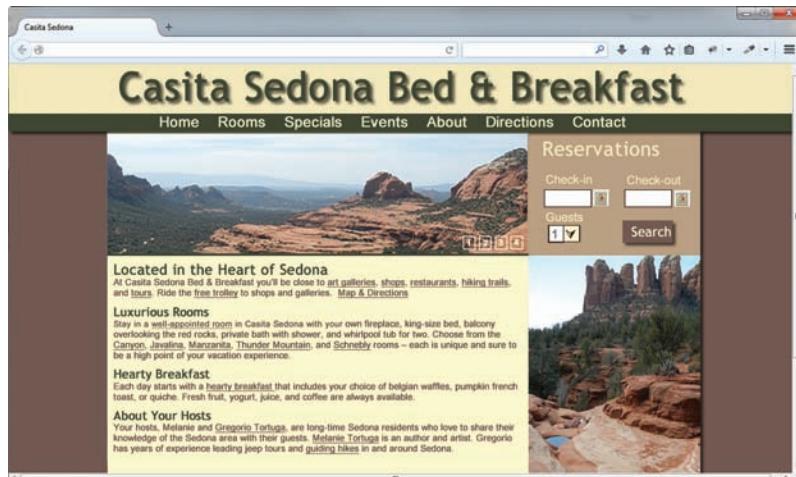


Figure 5.42 Desktop display of the web page

Display for netbooks and tablets using landscape orientation is depicted in Figure 5.43. Figure 5.44 demonstrates how the page would render on a tablet using portrait orientation. Figure 5.45 shows the web page displayed on a mobile device such as a smartphone—note the reduction of the logo area, removal of images, and prominent phone number.

You'll explore how to configure web pages with CSS media queries in Chapter 7.



Figure 5.43 Netbook display of the web page

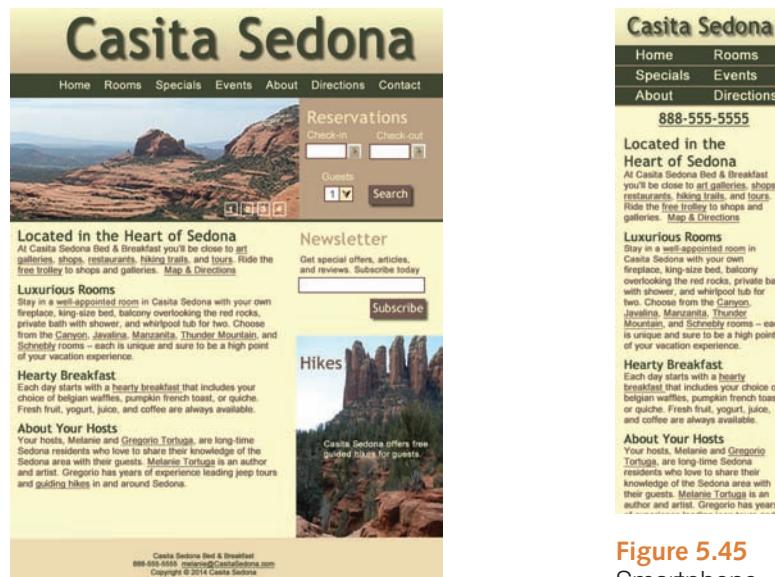


Figure 5.44 Portrait orientation tablet display of the web page

Figure 5.45
Smartphone
display of the
web page

5.12 Web Design Best Practices Checklist

Table 5.1 contains a checklist of recommended web design practices. Use this as a guide to help you create easy-to-read, usable, and accessible web pages.

Table 5.1 Web design best practices checklist Note: Web Design Best Practices Checklist is copyrighted by Terry Ann Morris, Ed.D. (<http://terrymorris.net/bestpractices>). Used by permission.

Page Layout	
<input type="checkbox"/>	1. Appealing to target audience
<input type="checkbox"/>	2. Consistent site header/logo
<input type="checkbox"/>	3. Consistent navigation area
<input type="checkbox"/>	4. Informative page title that includes the company/organization/site name
<input type="checkbox"/>	5. Page footer area includes copyright, last update, contact e-mail address
<input type="checkbox"/>	6. Good use of basic design principles: repetition, contrast, proximity, and alignment
<input type="checkbox"/>	7. Displays without horizontal scrolling at 1024 × 768 and higher resolutions
<input type="checkbox"/>	8. Balance of text/graphics/white space on page
<input type="checkbox"/>	9. Good contrast between text and background
<input type="checkbox"/>	10. Repetitive information (header/logo and navigation) occupies less than one-quarter to one-third of the browser window at 1024 × 768 resolution
<input type="checkbox"/>	11. Home page has compelling, interesting information above the fold (before scrolling down) at 1024 × 768 resolution
<input type="checkbox"/>	12. Home page downloads within 10 seconds on dial-up connection
<input type="checkbox"/>	13. Viewport meta tag is used to enhance display on smartphones (see Chapter 7)
<input type="checkbox"/>	14. Media queries configure responsive page layout for smartphone and tablet display (see Chapter 7)
Browser Compatibility	
<input type="checkbox"/>	1. Displays on current versions of Internet Explorer and Microsoft Edge
<input type="checkbox"/>	2. Displays on current versions of Firefox
<input type="checkbox"/>	3. Displays on current versions of Google Chrome
<input type="checkbox"/>	4. Displays on current versions of Safari
<input type="checkbox"/>	5. Displays on current versions of Opera
<input type="checkbox"/>	6. Displays on mobile devices (including tablets and smartphones)
Navigation	
<input type="checkbox"/>	1. Main navigation links are clearly and consistently labeled
<input type="checkbox"/>	2. Navigation is easy to use for target audience
<input type="checkbox"/>	3. If main navigation uses images, clear text links are in the footer section of the page
<input type="checkbox"/>	4. If main navigation uses Flash, clear text links are in the footer section of the page
<input type="checkbox"/>	5. Navigation is structured in an unordered list
<input type="checkbox"/>	6. Navigation aids (such as site map, skip to content link, and/or breadcrumbs) are used
<input type="checkbox"/>	7. All navigation hyperlinks work
Color and Graphics	
<input type="checkbox"/>	1. Color scheme is limited to a maximum of three or four colors plus neutrals
<input type="checkbox"/>	2. Color is used consistently
<input type="checkbox"/>	3. Background and text colors have sufficient contrast
<input type="checkbox"/>	4. Color is not used alone to convey meaning
<input type="checkbox"/>	5. Use of color and graphics enhances rather than detracts from the site
<input type="checkbox"/>	6. Graphics are optimized and do not slow download significantly
<input type="checkbox"/>	7. Each graphic used serves a clear purpose
<input type="checkbox"/>	8. Image tags use the alt attribute to configure alternate text replacement
<input type="checkbox"/>	9. Animated images do not distract from the site and do not endlessly repeat

(Continued)

Table 5.1 (Continued)

Multimedia (see Chapter 11)	
<input type="checkbox"/>	1. Each audio/video/Flash file used serves a clear purpose
<input type="checkbox"/>	2. The audio/video/Flash files used enhance rather than distract from the site
<input type="checkbox"/>	3. Captions or transcripts are provided for each audio or video file used
<input type="checkbox"/>	4. The file size is indicated for audio or video file downloads
<input type="checkbox"/>	5. Hyperlinks to downloads for media plug-ins are provided
Content Presentation	
<input type="checkbox"/>	1. Common fonts such as Arial, Verdana, Georgia, or Times New Roman are used
<input type="checkbox"/>	2. Writing techniques for the Web are used: headings, bullet points, brief paragraphs, and so on
<input type="checkbox"/>	3. Fonts, font sizes, and font colors are consistently used
<input type="checkbox"/>	4. If web fonts are configured, no more than one font typeface is used.
<input type="checkbox"/>	5. Content provides meaningful, useful information
<input type="checkbox"/>	6. Content is organized in a consistent manner
<input type="checkbox"/>	7. Information is easy to find (minimal clicks)
<input type="checkbox"/>	8. Timeliness: The date of the last revision and/or copyright date is accurate
<input type="checkbox"/>	9. Content does not include outdated material
<input type="checkbox"/>	10. Content is free of typographical and grammatical errors
<input type="checkbox"/>	11. Avoids the use of "Click here" when writing text for hyperlinks
<input type="checkbox"/>	12. Hyperlinks use a consistent set of colors to indicate visited/nonvisited status
<input type="checkbox"/>	13. Alternate text equivalent to content is provided for graphics and media
Functionality	
<input type="checkbox"/>	1. All internal hyperlinks work
<input type="checkbox"/>	2. All external hyperlinks work
<input type="checkbox"/>	3. All forms (see Chapter 9) function as expected
<input type="checkbox"/>	4. No JavaScript (see Chapters 11 and 14) errors are generated by the pages
Accessibility	
<input type="checkbox"/>	1. When the main navigation consists of images and/or multimedia, the page footer area contains text hyperlinks
<input type="checkbox"/>	2. Navigation is structured in an unordered list
<input type="checkbox"/>	3. Navigation aids, such as site map, skip navigation link, or breadcrumbs are used
<input type="checkbox"/>	4. Color is not used alone to convey meaning
<input type="checkbox"/>	5. Text color has sufficient contrast with background color
<input type="checkbox"/>	6. Image element use the alt attribute to configure alternate text replacement
<input type="checkbox"/>	7. If graphics are used to convey meaning, the alternate text equivalent is provided
<input type="checkbox"/>	8. If media is used to convey meaning, the alternate text equivalent is provided
<input type="checkbox"/>	9. Captions or transcripts are provided for each audio or video file used
<input type="checkbox"/>	10. Attributes designed to improve accessibility, such as alt and title, are used where appropriate
<input type="checkbox"/>	11. Use the id and headers attributes to improve the accessibility of table data (see Chapter 8)
<input type="checkbox"/>	12. If the site uses frames, frame titles are configured and meaningful content is placed in the no-frames area
<input type="checkbox"/>	13. To assist screen readers, the spoken language of the page is indicated with the HTML element's lang attribute
<input type="checkbox"/>	14. The role attribute indicates ARIA landmark roles (see Chapter 7)



Checkpoint 5.2

1. View the home page of your school. Use the Web Design Best Practices Checklist (Table 5.1) to evaluate the page. Describe the results.
2. View your favorite website (or a URL provided by your instructor). Maximize and resize the browser window. Decide whether the site uses fixed or fluid design. Adjust the screen resolution on your monitor to a different resolution than you normally use. Does the website look similar or very different? Offer two recommendations for improving the design of the site.
3. List three best practices used when placing graphics on web pages. View the home page of your school. Describe the use of web graphic design best practices on this page.

Chapter Summary

This chapter introduced recommended web design practices. The choices you make in the use of page layout, color, graphics, text, and media depend on your particular target audience. Developing an accessible web site should be the goal of every web developer. Visit the textbook website at <http://www.webdevfoundations.net> for examples, the links listed in this chapter, and updated information.

Key Terms

above the fold	linear organization	site map
alignment	load time	site search
analogous color scheme	media queries	skip to content
antialiasing	monochromatic color scheme	split complementary color scheme
breadcrumb trail	navigation bars	target audience
chunking	One Web	tetradic color scheme
color theory	page layouts	tint
color wheel	perceived load time	tone
complement	POUR	triadic color scheme
complementary color scheme	progressive enhancement	WAI (Web Accessibility Initiative)
contrast	proximity	Web Content Accessibility Guidelines 2.0 (WCAG 2.0)
fixed layout	random organization	white space
fluid layout	repetition	wireframe
hero	responsive web design	
hierarchical organization	screen resolutions	
horizontal scrolling	shade	

Review Questions

Multiple Choice

1. Which of the following is a sketch or blueprint of a web page that shows the structure (but not the detailed design) of basic page elements?
 - a. drawing
 - b. HTML code
 - c. site map
 - d. wireframe
2. Which of the following are the three most common methods for organizing websites?
 - a. horizontal, vertical, and diagonal
 - b. hierarchical, linear, and random
 - c. accessible, readable, and maintainable
 - d. none of the above
3. Which of the following is not a web design recommended practice?
 - a. Design your site to be easy to navigate.
 - b. Colorful pages appeal to everyone.
 - c. Design your pages to load quickly.
 - d. Limit the use of animated items.
4. Which of the following are the four principles of the Web Content Accessibility Guidelines?
 - a. repetition, contrast, proximity, and alignment
 - b. perceivable, operable, understandable, and robust
 - c. accessible, readable, maintainable, and reliable
 - d. hierarchical, linear, random, and sequential

5. Which of the following would a consistent website design *not* have?
- a similar navigation area on each content page
 - the same fonts on each content page
 - a different background color on each page
 - the same logo
6. Which of the following are influenced by the intended or target audience of a site?
- the amount of color used on the site
 - the font size and styles used on the site
 - the overall look and feel of the site
 - all of the above
7. Which of the following recommended design practices apply to a website that uses images for its main site navigation?
- Provide alternative text for the images.
 - Place text links at the bottom of the page.
 - Both a and b.
 - No special considerations are needed.
8. Which of the following is known as white space?
- the empty screen area around blocks of text and images
 - the background color of white used for a page
 - configuring the color of the text to be white
 - none of the above
9. Which of the following should you do when creating text hyperlinks?
- Create the entire sentence as a hyperlink.
 - Include the words “Click here” in your text.
 - Use a key phrase as a hyperlink.
 - none of the above
10. Which of the following is a color scheme that consists of two colors that are opposite each other on the color wheel?
- analogous
 - complementary
 - split complementary
 - contrasting

Fill in the Blank

11. The most common structure used for commercial websites is _____ organization.
12. All browsers and browser versions _____ display web pages in exactly the same way.
13. The _____ is a group whose mission is to create guidelines and standards for web accessibility.

Short Answer

14. Describe an issue to consider when designing for the mobile Web.
15. Describe one of the four principles of WCAG 2.0.

Hands-On Exercises

1. **Web Design Evaluation.** As you read this chapter, you explored web page design, including navigation design techniques and the design principles of repetition, contrast, proximity, and alignment. In this Hands-On Exercise, you’ll review and evaluate the design of a website. Your instructor may provide you with the URL of a website to evaluate. If not, choose a website to evaluate from the following list of URLs:

<http://www.arm.gov>
<http://www.telework.gov>
<http://www.dcmm.org>
<http://www.sedonalibrary.org>
<http://bostonglobe.com>
<http://www.alistapart.com>

Visit the website you are evaluating. Write a paper that includes the following information:

- a. URL of the website
 - b. Name of the website
 - c. Target audience
 - d. Screen shot of the home page
 - e. Indicate the type(s) of navigation evident.
 - f. Describe how the design principles of contrast, repetition, alignment, and contrast are applied. Be specific.
 - g. Complete the Web Design Best Practices Checklist (see Table 5.1).
 - h. Recommend three improvements for the website.
- 2.** Practice creating site maps for the following situations.
- a. Doug Kowalski is a freelance photographer who specializes in nature photography. He often gets contract work shooting photos for textbooks and journals. Doug would like a website that showcases his talents and provides publishers with an easy way to contact him. He would like a home page, a few pages with samples of his nature photographs, and a contact page. Create a site map based on this scenario.
 - b. Mary Ruarez owns a business, named Just Throw Me, which sells handcrafted specialty pillows. She currently sells at craft fairs and local gift shops, but would like to expand her business to the Web. She would like a website with a home page, a page that describes her products, a page for each of her seven pillow styles, and an order page. She has been advised that because she is collecting information from individuals, a page describing her privacy policy would be a good idea. Create a site map based on this scenario.
 - c. Prakesh Khan owns a dog-grooming business named A Dog's Life. He would like a website that includes a home page, a page about grooming services, a page with a map to his shop, a contact page, and a section that explains how to select a good pet. The content for the part of the website on selecting a pet will be a step-by-step presentation. Create a site map based on this scenario.
- 3.** Practice creating wireframe page layouts for the following situations. Use the style for page layout composition shown in Figures 5.32 – 5.35 where places for logo, navigation, text, and images are indicated. Do not worry about exact wording or exact images.
- a. Create sample wireframe page layouts for Doug Kowalski's photography business, described in 2(a). Create a wireframe layout for the home page. Create another wireframe page layout for the content pages.
 - b. Create sample wireframe page layouts for the Just Throw Me website described in 2(b). Create a wireframe layout for the home page. Create another wireframe page layout for the content pages.
 - c. Create sample wireframe page layouts for the A Dog's Life website described in 2(c). Create a wireframe layout for the home page and the regular content pages. Create another wireframe page layout for the presentation pages.

4. Choose two sites that are similar in nature or have a similar target audience, such as the following:

- Amazon.com (<http://www.amazon.com>) and Barnes & Noble (<http://www.bn.com>)
- Kohl's (<http://www.kohls.com>) and JCPenney (<http://www.jcpenney.com>)
- CNN (<http://www.cnn.com>) and MSNBC (<http://www.msnbc.com>)

Describe how the two sites you chose to review exhibit the design principles of repetition, contrast, proximity, and alignment.

5. Choose two sites that are similar in nature or have a similar target audience, such as the following:

- Crate & Barrel (<http://www.crateandbarrel.com>)
Pottery Barn (<http://www.potterybarn.com>)
- Harper College (<http://goforward.harpercollege.edu>)
College of Lake County (<http://www.clcillinois.edu>)
- Chicago Bears (<http://www.chicagobears.com>)
Green Bay Packers (<http://www.packers.com>)

Describe how the two sites you chose to review exhibit web design best practices. How would you improve these sites? Recommend three improvements for each site.

6. How would you design a home page for the following businesses using a fixed layout design? Create a wireframe page layout for the home page.

- a. See 2(a) for the description of Doug Kowalski's photography business.
- b. See 2(b) for the description of Just Throw Me.
- c. See 2(c) for the description of A Dog's Life.

7. How would you design a home page for the following businesses using a flexible layout design? Create a wireframe page layout for the home page.

- a. See 2(a) for the description of Doug Kowalski's photography business.
- b. See 2(b) for the description of Just Throw Me.
- c. See 2(c) for the description of A Dog's Life.

8. Visit the Media Queries website at <http://mediaqueri.es> to view a gallery of sites that demonstrate responsive web design. Choose one of the example responsive websites to explore. Write a one-page paper that includes the following:

- URL of the website
- Name of the website
- Three screen shots of the website (desktop display, tablet display, and smartphone display)
- Describe the similarities and differences between the three screen shots.
- Describe two ways in which the display has been modified for smartphones.
- Does the website meet the needs of its target audience in all three display modes? Why or why not? Justify your answer.

Web Research

1. This chapter introduced techniques that are useful when writing for the Web. Explore this topic further. Visit the resources listed below to get started.

- Writing for the Web: <http://www.useit.com/papers/webwriting>
- Writing Well for the Web: <http://www.webreference.com/content/writing>
- Web Writing that Works!: <http://www.webwritingthatworks.com/CGuideJOBAID.htm>
- A List Apart: 10 Tips on Writing the Living Web:
<http://www.alistapart.com/articles/writeliving>

If these resources are no longer available, search the Web for information on “writing for the Web.” Read one or more articles. Select five techniques that you would like to share with others. Write a one-page summary of your findings. Include the URLs of your resources.

2. Explore the trend of flat web design, which is a minimalist design style that avoids the use of 3D effects such as drop shadows and gradients and, instead, features blocks of color and distinctive typography. Explore this topic further. Visit the resources listed below to get started.

- <http://designmodo.com/flat-design-principles>
- <http://designmodo.com/flat-design-examples>
- <http://psd.fanextra.com/articles/flat-design-trend>
- <http://smashinghub.com/flat-designs-color-trends.htm>
- <http://www.designyourway.net/drbs/the-new-hot-trend-of-flat-web-design-with-examples>

If these resources are no longer available, search the Web for information on “flat web design.” Read one or more articles and visit the example websites that listed in the articles. Search the Web and locate a website that uses flat design. Write a paragraph that includes the URL of the website and describes how the website demonstrates the use of flat web design.

Focus on Web Design

1. This chapter discusses recommended web design practices. Sometimes it is helpful to learn about good design by examining poor design. Visit Web Pages that Suck (<http://www.webpagesthatsuck.com>) and read about their examples of poor design. Think about some websites that you have visited. Do any of them have similar qualities? Find two websites that use poor web design practices. Write a one-page report that includes an introduction about the design practices that are not followed at the websites, a link to each site, and a description of how each site has practiced poor website design.
2. Visit any of the websites referenced in this chapter that interest you. Write a one-page summary and reaction to the website you chose to visit. Address the following topics:
 - What is the purpose of the site?
 - Who is the intended audience?
 - Do you think the site reaches the intended audience?
 - List three examples of how this website uses recommended web design guidelines.
 - How could this site be improved?

3. In this activity you will design a color scheme, code an external CSS file for the color scheme, and code an example web page that applies the styles you configured. First, choose a topic for your web page. Explore the resources below to find out about the psychology of color:

- <http://www.infoplease.com/spot/colors1.html>
- <http://precisionintermedia.com/color>
- <http://www.webpagefx.com/blog/web-design/psychology-of-color-infographic/>

Complete the following tasks:

- a. Design a color scheme. List three hexadecimal color values in addition to neutrals such as white (#FFFFFF), black, #000000, gray (#EAEAEA or #CCCCCC), and dark brown (#471717) in your design.
- b. Describe the process you went through as you selected the colors. Describe why you chose these colors and why they would be appropriate for your website topic. List the URLs of any resources you used.
- c. Create an external CSS file named colors.css that configures font properties, text color, and background color selections for the document, h1 element selector, p element selector, and footer class using the colors you have chosen.
- d. Create a web page named color1.html that shows examples of the colors configured in the CSS style rules.



WEBSITE CASE STUDY

Web Design Best Practices

Each of the following case studies continues throughout most of this textbook. In this chapter, you are asked to analyze the design of the websites.

JavaJam Coffee House

See Chapter 2 for an introduction to the JavaJam Coffee House case study. Figure 2.30 shows a site map for the JavaJam website. Three pages for this site were created in earlier chapters. In this case study, you will review the site for recommended web design practices.

Hands-On Practice Case

1. Examine the site map in Figure 2.30. What type of site organization is used for the JavaJam website? Is it the most appropriate organization for the site? Why or why not?
2. Review the recommended web design practices from this chapter. Use the Web Design Best Practices Checklist (Table 5.1) to evaluate the JavaJam site that you created in earlier chapters. Cite three design practices that have been well implemented. Cite three design practices that could be implemented in a better way. How else would you improve the website?

Fish Creek Animal Hospital

See Chapter 2 for an introduction to the Fish Creek Animal Hospital case study. Figure 2.34 shows a site map for the Fish Creek website. Three pages for the site were created in earlier chapters. In this case study, you will review the site for recommended web design practices.

Hands-On Practice Case

1. Examine the site map in Figure 2.34. What type of site organization is used for the Fish Creek website? Is it the most appropriate organization for the site? Why or why not?
2. Review the recommended web design practices from this chapter. Use the Web Design Best Practices Checklist (Table 5.1) to evaluate the Fish Creek site that you created in earlier chapters. Cite three design practices that have been well implemented. Cite three design practices that could be implemented in a better way. How else would you improve the website?

Pacific Trails Resort

See Chapter 2 for an introduction to the Pacific Trails Resort case study. Figure 2.38 shows a site map for the Pacific Trails Resort website. Three pages for the site were created in earlier chapters. During this case study, you will review the site for recommended web design practices.

Hands-On Practice Case

1. Examine the site map in Figure 2.38. What type of site organization is used for the Pacific Trails Resort website? Is it the most appropriate organization for the site? Why or why not?
2. Review the recommended web design practices from this chapter. Use the Web Design Best Practices Checklist (Table 5.1) to evaluate the Pacific Trails Resort site that you created in earlier chapters. Cite three design practices that have been well implemented. Cite three design practices that could be implemented in a better way. How else would you improve the website?

Path of Light Yoga Studio

See Chapter 2 for an introduction to the Path of Light Yoga Studio case study. Figure 2.42 shows a site map for the Path of Light Yoga Studio website. Three pages for the site were created in earlier chapters. During this case study, you will review the site for recommended web design practices.

Hands-On Practice Case

1. Examine the site map in Figure 2.42. What type of site organization is used for the Path of Light Yoga Studio website? Is it the most appropriate organization for the site? Why or why not?
2. Review the recommended web design practices from this chapter. Use the Web Design Best Practices Checklist (Table 5.1) to evaluate the Path of Light Yoga Studio site you created in earlier chapters. Cite three design practices that have been well implemented. Cite three design practices that could be implemented in a better way. How else would you improve the website?

Web Project

The purpose of this Web Project case study is to design a website using recommended design practices. Your website might be about a favorite hobby or subject, your family, a church or club you belong to, a company a friend owns, or the company you work for. Your website will contain a home page and at least six (but no more than ten) content pages. Complete the following documents: Topic Approval, Site Map, and Page Layout Design. You will not develop web pages at this point; you will complete that task in later chapters.

Hands-On Practice Case

- 1. Web Project Topic Approval.** The topic of your website must be approved by your instructor. Provide the following information:
 - What is the purpose of the website?
 - List the reason you are creating the website.
 - What do you want the website to accomplish?
List the goals you have for the website.
 - Describe what needs to happen for you to consider your website a success.
 - Who is your target audience?
Describe your target audience by age, gender, socioeconomic characteristics, and so on.
 - What opportunity or issue is your website addressing?
For example, your website might address the opportunity to provide information about a topic to others or create an initial web presence for a company.
 - What type of content might be included in your website?
Describe the type of text, graphics, and media you will need for the website. While you should write the text content yourself, you may use outside sources for royalty-free images and multimedia. Review copyright considerations (see Chapter 1).
 - List the URLs for at least two related or similar websites found on the Web.
- 2. Web Project Site Map.** Use the drawing feature of a word processing program, a graphics application, or a paper and pencil to create a site map of your website that shows the hierarchy of pages and relationships between pages.
- 3. Web Project Page Layout Design.** Use the drawing feature of a word processing program, a graphics application, or paper and pencil to create wireframe page layouts for the home page and content pages of your site. Unless otherwise directed by your instructor, use the style for page layout composition shown in Figures 5.32–5.35.
Indicate where the logo, navigation, text, and images will be located. Do not worry about exact wording or exact images.