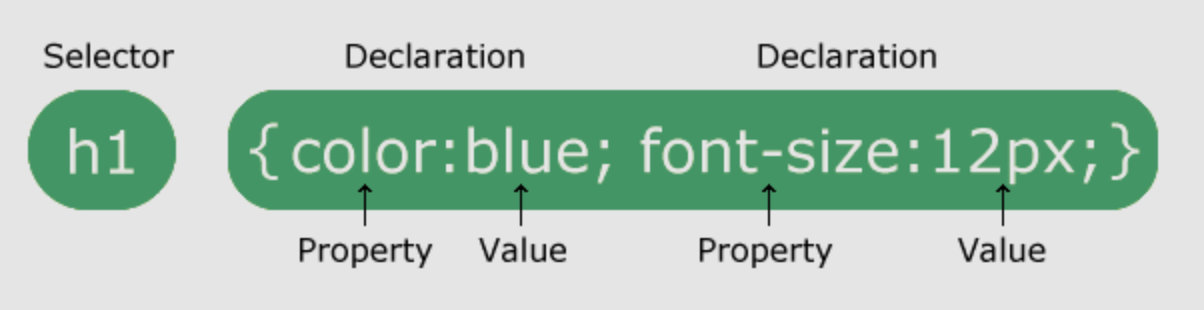
C779 - Web Development Fundamentals

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# Web Development Fundamentals - 70% of assessment

**Cascading Style Sheets (CSS3) and Graphical Elements**

* **Cascading Style Sheets** (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML.
* **CSS3** is the current version.
* A **CSS rule** consists of a selector and a declaration block.
  + Selectors - points to the HTML element you want to style.
  + Declaration - contains a CSS property name and a value, separated by a colon.



* CSS also allows you to group selectors, which minimizes the styling done to the sheet and can make site maintenance easier. We can do this by using a comma to separate selectors. Think of the **commas** as “and” - h1 and h2 and h3.

|  |
| --- |
| h1, h2, h3 {color: red;} |

* There are three ways of inserting a style sheet:
  + **External CSS** - External styles are defined within the <link> element, inside the <head> section of an HTML page:

|  |
| --- |
| <!DOCTYPE html> <**html**> <**head**> <**link** rel="stylesheet" href="mystyle.css"> </**head**> <**body**> |

* + **Internal CSS** - An internal style sheet may be used if one single HTML page has a unique style. The internal style is defined inside the <style> element, inside the head section.

|  |
| --- |
| **<!DOCTYPE html> <html> <head> <style> body {  background-color: linen; }  h1 {  color: maroon;  margin-left: 40px; } </style> </head>** |

* + **Inline CSS** - An inline style may be used to apply a unique style for a single element. To use inline styles, add the style attribute to the relevant element. The style attribute can contain any CSS property.

|  |
| --- |
| <!DOCTYPE html> <**html**> <**body**>  <**h1** style="color:blue;text-align:center;">This is a heading</**h1**> <**p** style="color:red;">This is a paragraph.</**p**>  </**body**> </**html**> |

How are tag selectors and class selectors different in purpose?

* If there are two or more CSS rules that point to the same element, the selector with the highest **specificity** value will "win", and its style declaration will be applied to that HTML element.
* The **!important** rule in CSS is used to add more importance to a property/value than normal. In fact, if you use the **!important rule,** it will override ALL previous styling rules for that specific property on that element.
* Stylesheets **cascade** — at a very simple level, this means that the order of CSS rules matters; when two rules apply that have equal specificity, the one that comes last in the CSS is the one that will be used.
* **Inheritance** - some CSS property values set on parent elements are inherited by their child elements, and some aren't.
* **CSS comments** are not displayed in the browser, but they can help document your source code.

|  |
| --- |
| /\* This is a single-line comment \*/ p {  color: red; } |

* **Sass** is a stylesheet language that’s compiled to CSS. It allows you to use variables, nested rules, mixins, functions, and more, all with a fully CSS-compatible syntax. **Sass** helps keep large stylesheets well-organized and makes it easy to share design within and across projects.

Identify 3 common image file formats used for Web.

**GIF, JPEG, PNG**

**GIF87a** is the original format for indexed color images. It uses LZW compression and has the option of being interlaced. **GIF89a** is the same, but also includes transparency and animation capabilities.

|  |
| --- |
| <**img** src="url" alt="alternatetext"> |

The **float** **property** can have one of the following values:

**left** - The element floats to the left of its container

**right** - The element floats to the right of its container

**none** - The element does not float (will be displayed just where it occurs in the text). This is default

**inherit** - The element inherits the float value of its parent

Always specify the **width and height** of an image. If width and height are not specified, the web page might flicker while the image loads.

* The required **alt attribute** provides an alternate text for an image, if the user for some reason cannot view it (because of slow connection, an error in the src attribute, or if the user uses a screen reader).
* **Responsive web design** is about creating web pages that look good on all devices. A responsive web design will automatically adjust for different screen sizes and viewports.
* **Interlacing** is a technique that allows an image to progressively display in a browser as it downloads. The image will appear in stages over the period of downloading time. This action makes your pages more accessible to users with slower Internet connections. This was important during the days of dial-up, but not widely seen with today’s broadband Internet connections.
* An image that supports **transparency** provides the visual effect of blending into the background of your Webpage. When used, the page background simply shows through the transparent part of the image file. Most developers use image transparency to remove the blank image background, so it appears to float on the page. However, you can make any element of an image transparent, not just its background.
* A **hexadecimal** color is specified with: #RRGGBB.
* RR (red), GG (green) and BB (blue) are hexadecimal integers between 00 and FF specifying the intensity of the color.
* For example, #0000FF is displayed as blue, because the blue component is set to its highest value (FF) and the others are set to 00.

|  |  |
| --- | --- |
| **Color** | **Hex Code** |
| Black | #000000 |
| White | #FFFFFF |
| Red | #FF0000 |
| Blue | #0000FF |
| Green | #008000 |

Links can be styled differently depending on what state they are in.

The four **links states** are:

a:link - a normal, unvisited link

a:visited - a link the user has visited

a:hover - a link when the user mouses over it

a:active - a link the moment it is clicked

A website is often divided into **headers**, **menus**, **content** and a **footer**.

A **header** is usually located at the top of the website (or right below a top navigation menu). It often contains a logo or the website name.

A **navigation bar** contains a list of links to help visitors navigate through your website.

The **footer** is placed at the bottom of your page. It often contains information like copyright and contact info.

Nav, header, main, and footer tags are **semantic** because they are used to represent different sections on an HTML page. These are more descriptive than div tags which make partitioning web pages into tangible sections difficult.

An element with position: **static**; is not positioned in any special way; it is always positioned according to the normal flow of the page.

An element with position: **relative**; is positioned relative to its normal position.

An element with position: **fixed**; is positioned relative to the viewport, which means it always stays in the same place even if the page is scrolled. The top, right, bottom, and left properties are used to position the element.

A **fixed** element does not leave a gap in the page where it would normally have been located.

An element with position: **sticky**; is positioned based on the user's scroll position.

Many years ago, when computers supported a maximum 256 different colors, a list of **216 "Web Safe Colors"** was suggested as a Web standard (reserving 40 fixed system colors). This is not as important now, since most computers can display millions of different colors.

This **216 hex values** cross-browser color palette was created to ensure that all computers would display the colors correctly when running a 256 color palette:

The font-family property should hold several font names as a "**fallback**" system, to ensure maximum compatibility between browsers/operating systems. Start with the font you want, and end with a generic family (to let the browser pick a similar font in the generic family, if no other fonts are available). The font names should be separated with commas.

|  |
| --- |
| .p1 {  font-family: "Times New Roman", Times, serif; } |

In CSS, the term **"box model"** is used when talking about design and layout.

**Padding** is used to create space around an element's content, inside of any defined borders.

**Margins** are used to create space around elements, outside of any defined borders.

The **position** property specifies the type of positioning method used for an element (static, relative, fixed, absolute or sticky).

**Margins** are used to create space around elements, outside of any defined borders.

If the **margin** property has four values (goes clockwise):

margin: 2% 3% 4% 5%;

top margin is 2%

right margin is 3%

bottom margin is 4%

left margin is 5%

**Integrating HTML, CSS3, and Media**

* HTML was created to describe the content of a web page.

The HTML **<img> tag** is used to embed an image in a web page.

|  |
| --- |
| <**img** src="url" alt="alternatetext"> |

The **<img>** tag has two required attributes:

**src** - Specifies the path to the image

**alt** - Specifies an alternate text for the image

* The HTML **<video>** element is used to show a video on a web page. The MP4, WebM, and Ogg formats are supported by HTML.
* The **controls attribute** adds video controls, like play, pause, and volume.
* The **poster attribute** specifies an image to be shown while the video is downloading, or until the user hits the play button. If this is not included, the first frame of the video will be used instead.
* The **<source> element** allows you to specify alternative video files which the browser may choose from. The browser will use the first recognized format.

|  |
| --- |
| <**audio** controls autoplay>  <**source** src="horse.ogg" type="audio/ogg">  <**source** src="horse.mp3" type="audio/mpeg"> Your browser does not support the audio element. </**audio**> |

* The HTML **<audio>** element is used to play an audio file on a web page. To start an audio file automatically, use the **autoplay** attribute. The MP3, OGG, and WAV formats are supported by HTML. Modern major browsers support these file formats, except Safari. Safari does not support Ogg.
* The **<iframe>** tag specifies an inline frame. An **inline frame** is used to embed another document within the current HTML document.
* **Vector** — graphics that use mathematical coordinates with lines, curves, and shapes to create images and specify colors. Vector graphics can be created using various software tools, such as Adobe Illustrator. Vector graphics are generally small in file size. **Vector** **graphics** **are** **scalable**, which means they keep their image quality when enlarged or shrunk.
* **Bitmap** — graphics that use small dots (usually thousands) to create images and specify colors. Each dot is mapped to bits stored in a computer's memory. Bitmaps are also called raster graphics, and they include the JPEG, GIF and PNG formats. Digitized photographs are the most common type of bitmap seen on the Web. Bitmap images can be created using software tools such as Microsoft Paint. Making bitmap images more detailed can create large file sizes. Removing pixels and compressing files will decrease file size but will also reduce image quality.
* An image that supports **transparency** provides the visual effect of blending into the background of your Webpage. When used, the page background simply shows through the transparent part of the image file. Most developers use image transparency to remove the blank image background, so it appears to float on the page. However, you can make any element of an image transparent, not just its background.
* Know and understand how to use the CSS opacity property.
* Which CSS opacity value is more transparent: 0.3 or 0.75?
* **Interlacing** is a technique that allows an image to progressively display in a browser as it downloads. The image will appear in stages over the period of downloading time. This action makes your pages more accessible to users with slower Internet connections. This was important during the days of dial-up, but not widely seen with today’s broadband Internet connections.
* The first pass will render roughly 13 percent of the entire image. The second pass delivers 25 percent, and then continues in 25-percent increments until the image renders completely. During this process, the full image will at first appear fuzzy, but will continuously sharpen.
* The only Web-ready image file formats that **support interlacing** are GIF and PNG
* The only Web-ready image file formats that **support animation** are GIF, PNG and MNG.
* When you design an **image**, each individual component of the image can be created on its own **layer**, thus allowing that component to be manipulated independently of the entire image. A series of layers will compose an entire image, and an image can have as many layers as necessary. However, although layers are supported in the PNG file format, they are not supported by GIF or JPG formats.
* **Scalable Vector Graphics (SVG)** is a W3C-recommended language developed by various vendors, including Adobe, Microsoft and Sun. SVG uses XML to describe graphics and graphical applications. SVG allows you to create cross-platform animated movies. Not all SVG images are animated, but this application is common because SVG offers comprehensive animation support. Unlike Flash, SVG is an open standard. However, it provides similar features in addition to animation
* An **image map** is an image that includes hyperlinks within specific areas of the image. These linked areas, or hot spots, are defined by a set of coordinates.
* The following tags are used to create a **hotspot**: <img>, <map>, and <area>.
* Possible hotspot shapes include:
  + **rect**: used to create a rectangular area
  + **circle**: used to create a circular area
  + **poly**: used to create a polygonal area
  + **default**: used to define the entire area
* The HTML **<canvas>** element is used to draw graphics, on the fly, via JavaScript.

**Markup and HTML5 Coding**

* A **markup language** is a set of rules governing what markup information may be included in a document and how it is combined with the content of the document in a way to facilitate use by humans and computer programs.
* **HTML** is the markup language that defines page structure, hyperlinks, graphics and more to enable pages to render in Web browsers and other devices.
* **HTML 5.2** is the latest version.
* The **HTML 4.01** Recommendation (released in 1999) contained many improvements from HTML 3.2, most notably Cascading Style Sheets (CSS). You can access this standard at www.w3.org/TR/html4/. The 4.01 specification included minor modifications to the 4.0 specification.
* **Cascading Style Sheets (CSS)** are rules in an external text file that determine how to display HTML elements in your Webpages. CSS3 contains formatting instructions that can define the font, color and phrase elements used on a particular markup page.
* It is possible to validate all markup code automatically. Many **validators** exist, but the most authoritative is the **W3C Markup Validation Service** (https://validator.w3.org/).
* **Javascript** is a scripting language that provides dynamic, interactive capabilities to Web Pages.
* The **web development trifecta** includes HTML, CSS, and Javascript.
* Identify the following protocols: HTTP, HTTPS, TCP/IP, FTP, and SMTP.
* Describe a text editor. Name three examples.
* Describe a GUI editor. Name three examples.
* What are the main differences between a text editor and GUI editor?
* A **URL** is another word for a web address. A **URL** can be composed of words (e.g. w3schools.com), or an Internet Protocol (IP) address (e.g. 192.68.20.50).
* **Extensible Markup Language (XML) i**s a language used to describe data elements on a Webpage. XML enhances the structure and navigation of data. It is not used to format the page's appearance. Businesses use XML because it allows data to be interchanged with all types of applications.
* What is the difference between HTML and XML?
* What is the difference between the World Wide Web (WWW) and the Internet?
* What is the W3C?
* Understand the basic syntax of an HTML element.
* Code it. Know how to add an attribute and value to a tag.
* Know and identify types of container tags.
* Know and identify types of empty tags.
* Know and understand the difference between a container tag and empty tag.
* Give three examples of a container tag and three examples of an empty tag.
* Code it. Create a basic webpage with the following elements:
* DOCTYPE
* html
* head
* title
* meta
* body
* Examine the following HTML tag. What is the tag? What is the attribute? What is the value?
* <meta charset=”utf-8”>
* Identify three attributes used within a meta tag.
* Identify and describe a website file structure.
* Know the difference between block-level elements and inline/text-level elements.
* Identify a block element.
* Identify an inline element.
* Know how to insert a thematic break <hr>, formerly known as a horizontal rule.
* What is the <br> tag?

There are three types of **lists** you can create with HTML:

* **Unordered List -** An unordered list begins with the <ul> tag. Each list item starts with the <li> tag. By default, the list items are marked by bullet points.

|  |
| --- |
| <**ul**>  <**li**>Coffee</**li**>  <**li**>Tea</**li**>  <**li**>Milk</**li**> </**ul**> |

* **Ordered List** - An ordered list begins with the <ol> tag. Each list item starts with the <li> tag. By default, the list items are marked numerically.

|  |
| --- |
| <**ol**>  <**li**>Coffee</**li**>  <**li**>Tea</**li**>  <**li**>Milk</**li**> </**ol**> |

* A **description list** is a list of terms, with a description of each term. The <dl> tag defines the description list, the <dt> tag defines the term (name), and the <dd> tag describes each term.

|  |
| --- |
| <**dl**>  <**dt**>Coffee</**dt**>  <**dd**>- black hot drink</**dd**>  <**dt**>Milk</**dt**>  <**dd**>- white cold drink</**dd**> </**dl**> |

**Heading elements** start at the larger text (h1) to smallest text (h6). By default, the h4 heading element is the same size as the default text.

* **Nesting** is the process of adding a pair of tags within another pair of tags
* What elements are nested within a head element?
* What is a relative or local link?
* What is an absolute link?
* What is an external hyperlink?
* What is an internal link (also known as a bookmark)?

**Link rot** is the phenomenon of hyperlinks tending over time to cease to point to their originally targeted file, web page, or server due to that resource being relocated to a new address or becoming permanently unavailable.

* Can you create a link to wgu.edu that opens in a new tab?
* What is the purpose of a div element?
* Specify how and when to use a span element.
* Identify the purpose of the table element.
* Identify the purpose of the tr element.
* Identify the purpose of the th element.
* Identify the purpose of the td element.
* Identify the purpose of the caption element.
* Code it. Create a table with three columns and three rows.
* Identify the purpose of the colspan attribute.
* Identify the purpose of the rowspan attribute.
* Code it. Practice coding a table with the colspan and rowspan.
* Identify five common CSS properties used to style tables and describe how each format a table.
* When should a table be used?
* When should we NOT use a table?
* Identify 5 semantic HTML elements and their purpose.
* What is the difference between head, header, and heading elements?
* Know how to add HTML Entities to a webpage.
* Understand website file structure/file path.
* Identify the steps in the Web Development Project Cycle and describe each.
* Know and identify a wireframe.
* Identify the type of input provided by stakeholders.
* Know and identify a sitemap.
* Understand the tasks performed during website maintenance/management.

**The Americans with Disabilities Act (ADA)** was signed into law on July 26, 1990, by President George H.W. Bush. The ADA is one of America's most comprehensive pieces of civil rights legislation that prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of American life.

**Section 508 of the Rehabilitation Act** requires federal agencies to develop, procure, maintain and use information and communications technology that is accessible to people with disabilities - regardless of whether or not they work for the federal government.

**Accessibility Principles**

**Perceivable information and user interface**

* Text alternatives for non-text content
* Captions and other alternatives for multimedia
* Content can be presented in different ways
* Content is easier to see and hear

**Operable user interface and navigation**

* Functionality is available from a keyboard
* Users have enough time to read and use the content
* Content does not cause seizures and physical reactions
* Users can easily navigate, find content, and determine where they are
* Users can use different input modalities beyond keyboard

**Understandable information and user interface**

* Text is readable and understandable
* Content appears and operates in predictable ways
* Users are helped to avoid and correct mistakes

**Robust content and reliable interpretation**

* Content is compatible with current and future user tools

**The World Wide Web Consortium (W3C)** develops international standards for the Web: HTML, CSS, and many more.

**The W3C Web Accessibility Initiative (WAI)** develops standards and support materials to help you understand and implement accessibility.

**Web Content Accessibility Guidelines (WCAG)** is developed through the W3C process in cooperation with individuals and organizations around the world, with a goal of providing a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally.

**The Authoring Tool Accessibility Guidelines (ATAG)** documents explain how to make the authoring tools themselves accessible, so that people with disabilities can create web content, and help authors create more accessible web content.

* Web pages should be accessible to all people, including those with disabilities.
* The following includes some common challenges and solutions for accommodating Web users with **vision impairment**:
  + **Text readability** — Make sure that fonts used are the correct size.
  + **Text support for images** — All images must be described in text using special HTML code.
  + **Screen-reader support** — Ensure that all pages and page elements can be rendered by audio screen readers.
* The following includes some common challenges and solutions for accommodating Web users with **hearing impairment:**
  + **Alternative audio support** — If you include audio content on a page, make sure that a text-based equivalent is readily available for hearing-impaired users.
  + **Alternative speech input** —If your site includes the ability for speech input, make sure that an equivalent keyboard entry mechanism is available.
  + **Text support for audio elements** — Make sure that any audio elements are clearly marked with alternative text so that readers can obtain the information.
* The following includes some common challenges and solutions for accommodating Web users with **cognitive impairment or equipment limitations:**
  + **Page content that flashes, flickers or strobes —** Such content may cause problems for those with neurological disorders.
  + **Alternative navigation** —Navigation aids should be provided to help those with lower cognitive skills.
  + **Audio support** — Audio transcriptions of text-based content may help users with reading disabilities such as dyslexia.
  + **Low-resolution alternatives** — Design Web pages so that they do not require large, expensive screen resolutions, or provide low-resolution alternatives.
* The **Lynx** browser is a particularly useful tool for testing web site accessibility. **Lynx** is entirely text based and supports braille displays and screen readers, which means that it uses the alt, name and title attributes associated with images and other non-text-based content instead of displaying the elements themselves.

**Web Forms**

* Websites use **forms** to obtain input from users. You can create several types of fields in one form to collect various types of user input. Such input can include the user's name, address and credit card number, for example. The information a user enters into the form is then submitted to a server where it is stored and/or processed.
* After a user has entered information into a **Web form,** he or she clicks the form's Submit button. Submitting the form uploads or emails the user's information to the receiving server. Many Web forms also provide a Reset button that clears entered data instead of submitting it, and resets the form fields to the default values.
* **Forms** are of little use without an application on a Web server to process the submitted information. CGI scripts perform this information processing. The following sections discuss the ways that CGI scripts receive and process Web form information. The rest of the lesson will teach you how to develop Web forms using HTML.
* What elements are included within a form?
* The HTML <form> element can contain one or more of the following form elements:
  + <input>
  + <label>
  + <select>
  + <textarea>
  + <button>
  + <fieldset>
  + <legend>
  + <datalist>
  + <output>
  + <option>
  + <optgroup>
* One type of form element is the **<input>** element. The **<input>** element can be displayed in several ways, depending on the type attribute.
* What are the different types of input elements?
* What is the purpose of each input type? What does it look like on a webpage?
* What is the purpose of the method and action form attributes?
* What are three types of buttons used in a web form?
* The **<label>** element defines a label for several form elements. The **<label>** element is useful for screen-reader users, because the screen-reader will read out loud the label when the user focuses on the input element.
* How do you "bind" a label to an input element?
* What input type would you use to create a group of mutually exclusive options, such as a survey?
* What input type would you use to create a group of options where many could be selected?
* The **<select>** element defines a drop-down list. The **<option>** element defines an option that can be selected.
* The <textarea> element defines a multi-line input field (a text area).
  + The **rows** attribute specifies the visible number of lines in a text area.
  + The **cols** attribute specifies the visible width of a text area.
* What is CGI? What is a CGI script?
* Identify the differences between server-side scripting and client-side scripting.
* Describe CAPTCHA and its purpose.
* What are name/value pairs in a form?
* Identify a query string.

**Industry Standards**

* Identify three characteristics of a server-side language.
* Identify three ways in which server-side scripts are used.
* Identify five common server-side languages.
* Identify Microsoft’s original server-side scripting solution.
* Identify a common client-side language.
* What is the difference between an interpreted and a compiled language?
* Identify at least two potential problems with a client-side language.
* Identify the three advantages of JavaScript, as noted within the reading.
* What is DHTML?
* What is the DOM? How do we use it?
* Give an example of a DOM object.
* What is an HTML5 API?
* Identify three HTML5 APIs.
* When working with offline web applications, what instructs the browser to store certain files locally to allow the user to continue working without the connection?

**GUI HTML Editors and Mobile Websites**

* What is a text editor?
* Identity a type of text editor and provide two examples.
* Identify one feature of a text editor.
* List three pros and three cons of a text editor.
* What is a GUI editor? What is another name for a GUI editor?
* Identify the two types of GUI editors and provide three examples.
* List three pros and three cons of using a GUI editor.
* Identify five features of a GUI editor.
* What is the URL for the W3C markup validation?
* What is the URL for the W3C CSS validation?
* What is FTP? Identify its use for the web.
* Identify the purpose of a test web server.
* Identify six suggestions for optimizing a website for mobile devices.
* What is the purpose of the viewport meta tag?
* What is AJAX?
* What is Web 2.0? Provide five examples.
* What is a Web Feed?

# Website Development for Business - 30% of assessment

**Developing and Maintaining a Website**

There are seven main steps in the **Web Development Project Cycle**.

1. Information Gathering
2. Planning
3. Design
4. Content Writing and Assembly
5. Coding
6. Testing, Review, and Launch
7. Maintenance

* Identify three advantages and three disadvantages of the Waterfall Model.
* What are the responsibilities of a web project manager?
* What is the difference between the design phase and implementation phase?
* What is a sitemap? Be able to identify or draw a sitemap.

**Branding** is the creation of a distinctive identity and place in the market for a product or organization. Allows consumers to readily identify a product and its purpose. The look and feel of your Website is often part of a marketing department's branding.

The brand should be simple.

The brand should be different.

The brand should be safe.

The brand should make a promise.

The brand should reflect the company’s attributes.

The brand should reflect the company’s personality.

The brand should appeal to the intended audience.

You must first have a clearly established brand before you can begin to create a compelling **Webpage**.

**Effectively designed pages:**

* Feature crisp, concise text (limiting the word count to half of what would be used in conventional writing).
* Include one idea per paragraph
* Include search engine keywords in the main portions of the text.
* Convey the central message using the inverted-pyramid writing style (i.e., the conclusion is presented at the top of the page, followed by supporting information).

**Three major e-commerce models that are widely implemented:**

* **Business-to-Consumer (B2C)** - A model in which a Web-based business sells products and/or services to consumers or end users.
* **Business-to-Business (B2B)** - A model in which a Web-based business sells products and/or services to other businesses.
* **Consumer-to-Consumer (C2C)** - A model in which individual consumers sell products or services to other consumers.

A **niche market** is the subset of the market on which a specific product is focused

**Mind share** is the effect of marketing efforts influencing a particular target market or demographic. Mind share includes commercial phrases, catch words and sound bites that provoke recognition of the product, service, or company by the public.

A **target market** is a group of customers within a business's serviceable available market at which a business aims its marketing efforts and resources.

A business (usually Web-based) that markets and sells goods and services that it does not own or store. The **aggregator** allows other vendors to compete using its site, and then takes a percentage of the business. In essence, the site acts as a portal for an entire industry niche.

**End-User Web Experience**

* **Search Engine Optimization (SEO)** is the use of specific techniques to increase a page's or site's rank on a search engine (such as Google, Yahoo! or Bing). Such techniques are said to be “organic" because they do not include paid advertisements of any kind. SEO experts edit pages and sites to enable search engines to recognize the inherent value of the content and services on the site.
* **Pay Per Click (PPC) -** an Internet marketing technique in which you pay for high search engine results by advertising on keywords that describe your product or service. You pay your site hosts only when your ads are clicked by the user.
* **Web Analytics -** The practice of collecting data and studying user behavior in an attempt to increase market share and sales.

Organizations need standard methods for exchanging funds just as much as they need standards for exchanging information. Several e-commerce payment technologies are in common use, either as transaction methods or as tools to secure transactions:

* **Electronic Funds Transfer (EFT)** – Electronic Funds Transfer) is a generic term that describes the ability to transfer funds using computers, rather than using paper. Banks use EFT to save time and ensure that monetary exchange between individuals and businesses is as secure as possible. Other large organizations use EFT as well.
* **Payment gateways** – A payment gateway is a system, either hardware-based or software-based, that mediates between a merchant (i.e., an e-commerce-enabled Website) and an acquirer (e.g., the merchant's bank). End users do not configure their systems to become payment gateways. Once the merchant receives payment from a customer, the merchant uses the payment gateway to transmit credit card information to the bank.
* **3-D Secure** – 3-D Secure is an XML-based protocol used by credit card companies to add security to online credit and debit card transactions. It is often listed as "Verified by VISA" or "MasterCard Secure Code." 3-D Secure has replaced the Secure Electronic Transactions (SET) protocol.
* **Secure Sockets Layer (SSL) and Transport Layer Security (TLS)** are methods used to encrypt data transmissions. They act as the foundation for many e-commerce protocols, including 3-D Secure. TLS is quite like SSL, but TLS is an open standard that is updated frequently.
* What is HTTPS?
* What is encryption?
* What is plagiarism?
* **Wireframing** is another helpful tool for Website planning. Wireframing is the process of developing an outline for a Web presence. A wireframe is presented as a visual representation of a Web Page layout. **Wireframes** usually focus on representing a Website's layout. Multiple wireframes can make up a storyboard, which will be discussed later in the lesson.
* Know and describe the following intellectual property terms: trade secret, copyright, trademark, licensing, infringement, and plagiarism.
* The **United Nations Educational, Scientific and Cultural Organization** (**UNESCO**) is a specialized agency of the United Nations aimed at promoting world peace and security through international cooperation in education, arts, sciences and culture.
* Increasingly, Web development work (including site design) is being **outsourced** to workers in remote locations. When **outsourcing** occurs, a local team of workers often remains to perform some tasks (sometimes permanently, sometimes only for a short time).
* **E-commerce** requires you to understand global issues. Remember that by placing a business on the Web, the audience is expanded to include anyone in the world with a browser and Internet access.
* **Currency differences** – E-commerce sites such as eBay and global businesses such as IBM facilitate business with people in many different countries. These businesses must be able to automatically calculate exchange rates for the day of the transaction (often called currency conversion). They must also calculate taxes and tariffs on goods, which incur additional costs.
* **International shipping –** When shipping goods internationally, you must consider searches by customs, costs incurred by customs, delays caused by customs, and all tariffs. A product you sell legally in one country may be illegal in another or heavily regulated.
* **Language concerns –** Consider the language(s) used by the target audience and the characters necessary (e.g., alphanumeric, mathematical or currency symbols). You may be assigned to create a page for a language that requires a particular character set. To solve this problem, specify Unicode support for all your site's Webpages. The Unicode Technical Committee (UTC) maintains the Unicode standard. The UTC is a subcommittee of the Unicode Consortium (www.unicode.org).
* **Relationship management –** Every business wants to establish solid relationships with all parties involved. Two important concepts that can help you ensure success are trust-building and customer self-service. Trust is built through quality customer service and frequent contact. Customer self-service includes the ability to track orders, customize orders (such as modify or cancel an order, change a shipping address, etc.) and choose products without the help of a live person.

**Web Servers**

* Identify and describe various web server technologies.
* Describe push technology.
* Describe pull technology.
* What is a vertical portal?
* What is a horizontal portal?

A **wiki** is a site that is designed for groups of people to quickly capture and share ideas by creating simple pages and linking them together.

**Multipurpose Internet Mail Extensions (MIME)** is an Internet standard that extends the format of email messages to support text in character sets other than ASCII, as well as attachments of audio, video, images, and application programs.

* Identify 10 common file formats used for the web.
* Identify potential issues with proprietary file formats.
* Identify and describe four types of databases.
* Identify two types of database connections.
* Understand and compare web hosting solutions.

**Structured Query Language (SQL)** is a standardized programming language that is used to manage relational databases and perform various operations on the data in them.

* When you enter a domain into a browser address bar, what is the name of the page that the server looks for to display?
* Identify two pros and two cons for each of the following:

Dedicated Server Hosting

Virtual

Co-location

A **cloud service provider** is a third-party company offering a cloud-based platform, infrastructure, application, or storage services. Much like a homeowner would pay for a utility such as electricity or gas, companies typically have to pay only for the amount of cloud services they use, as business demands require.

**Software as a service (SaaS)** is a software licensing and delivery model in which software is licensed on a subscription basis and is centrally hosted. Examples include Google Workspace, Dropbox, Salesforce, Cisco WebEx, Concur, GoToMeeting.