# Web Development & Design Foundations with HTML5 8th Edition

CHAPTER 11
KEY CONCEPTS

## Learning Outcomes

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

- Describe the purpose of plug-ins, helper applications, media containers, and codecs
- Describe types of multimedia files used on the Web
- Configure hyperlinks to multimedia files
- Configure audio and video on a web page with HTML5 elements
- Describe features and common uses of Adobe Flash, JavaScript, Java applets, Ajax, and jQuery
- Configure a Flash animation on a web page
- Configure a Java applet on a web page
- Create an interactive image gallery with CSS
- Configure the CSS3 transform and transition properties
- Describe the purpose of geolocation, web storage, offline web applications, and canvas HTML5 APIs.

## Helper Applications & Plug-ins

Helper Application
- A program that can be designated to handle a particular file type (such as .wav or .mpg) to allow the user to view or otherwise utilize the special file.
- The helper application runs in a separate window from the browser.

Plug-In
- A newer and more common method
- Plug-ins run right in the browser window so that media objects can be integrated directly into the web page.

## Containers & Codecs

Container
- Designated by the file extension – contains the media and metadata

Codec
- The algorithm used to compress the media

HTML5 audio & video
- Native to the browser
- ISSUE: Browsers do not all support the same codecs
  - http://www.longtailvideo.com/html5/

## Commonly Used Plug-ins

Adobe Flash Player

Adobe Reader

Windows Media Player

Apple Quicktime

## Common Audio File Types

| | |
|---|---|
| .wav | Wave File |
| .aiff | Audio Interchange File Format |
| .mid | Musical Instrument Digital Interface (MIDI) |
| .au | Sun UNIX sound file |
| .mp3 | MPEG-1 Audio Layer-3 |
| .ogg | Ogg Vorbis (open-source) |
| . m4a | MPEG 4 Audio. This audio-only MPEG-4 format is supported by Quicktime, iTunes, and iPods. |

## Common Video File Types

| | |
|---|---|
| .mov | Quicktime |
| .avi | Microsoft Audio Video Interleaved |
| .wmv | Windows Media File |
| .flv | Flash Video File |
| .mpg | MPEG (Motion Picture Experts Group) |
| .m4v .mp4 | (MPEG-4) |
| .ogv | Ogg Theora (open-source) |
| .webm | VP8 codec (open video format, free) |

## Copyright Issues

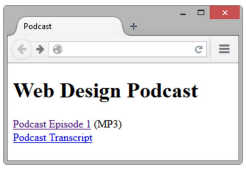
- Only publish web pages, images, and other media that you have personally created or have obtained the rights or license to use.
- Ask permission to use media created by another person instead of simply "grabbing" it.
- All work (including web pages) are automatically copyrighted even if there is not copyright mark or date.
- Fair Use Clause of the Copyright Act
- Creative Commons – A new approach to copyright

## Configure Audio & Video

Most basic method to provide audio or video files:
Hyperlink

```
<a href="wdfpodcast.mp3" title="Web Design
  Podcast">Web Design Podcast</a>
```



## Multimedia & Accessibility

Provide alternate content

- Transcript (for audio)
- Captions (for video)
- Text format

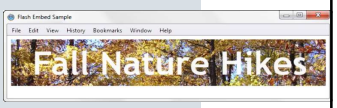
## What is Adobe Flash?

- A popular multimedia application
- Create multimedia which adds visual interest and interactivity to web pages
- Flash movies are saved in ".swf" files
- Perception of speedy display
- .swf files play as they download
- Flash Player
  - Free browser plug-in
  - Widely installed on desktop browsers but not well-supported by mobile devices

## HTML5 Embed Element

```
<embed type="application/x-shockwave-flash"
      src="fall5.swf"
        width="640"
        height="100"
        quality="high"
        title="Fall Nature Hikes">
```



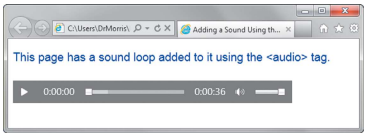

 

## Checkpoint

1. List three common web browser plug-ins and describe their use.
2. Describe issues involved with adding media such as audio or video to a web page.
3. Describe a disadvantage of using Flash on a web page.

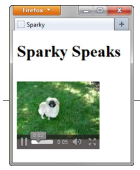
## HTML5 Audio & Source Elements




```
<audio controls="controls">
  <source src="soundloop.mp3" type="audio/mpeg">
 <source src="soundloop.ogg" type="audio/ogg">
 <a href="soundloop.mp3">Download the Audio File</a> (MP3)
</audio>
```

## HTML5 Video & Source Elements




```
<video controls="controls" poster="sparky.jpg"
    width="160" height="150">
 <source src="sparky.m4v" type="video/mp4">
 <source src="sparky.ogv" type="video/ogg">
  <a href="sparky.mov">Sparky the Dog</a> (.mov)
</video>
```

## CSS Drop Down Menu

- Configure nav container with position relative
- Code submenu (drop down menu) ul element with the parent li element
- Configure submenu ul element to initially not display
- Configure submenu ul element with absolute positioning

## CSS3 Transform Property

Allows you to rotate, scale, skew, or move an element

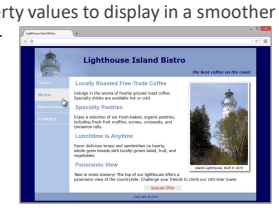
Example:

```
transform: rotate(3deg);
```

## CSS3 Transition Property

Provides for changes in property values to display in a smoother manner over a specified time.




Example:

```
nav a:hover { color: #869dc7; background-color: #eaeaea;
transition: background-color 2s linear; }
```

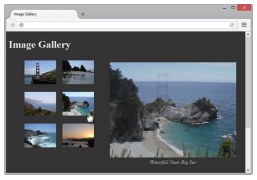
## CSS Image Gallery

Configure each thumbnail image:

```
<li><a href="photo1.jpg"><img src="photo1thumb.jpg"   width="100" height="75"
 alt="Golden Gate Bridge">
     <span><img src="photo1.jpg"  width="400"  height="300“
   alt="Golden Gate Bridge"><br>Golden Gate Bridge </span></a>
 </li>
```

The key CSS:

```
#gallery span { position: absolute;
                opacity: 0;
                transition: opacity 3s ease-in-out;
                left: -1000px; }
#gallery a:hover span       {
                position: absolute;
                top: 16px; left: 320px;
                text-align: center; }
```



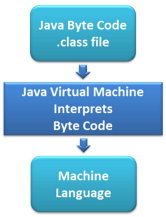

 

## What is Java?

- Object Oriented Programming (OOP)
- Developed by Sun Microsystems
- Java is not the same language as JavaScript.
- Java is more powerful and much more flexible than JavaScript.
- Java can be used to:
  - develop stand-alone executable applications
  - applets that are invoked by Web pages

## Java Applets




Compiled -- translated from the English-like Java statements to an encoded form called Byte Code.

Use the "**.class**" file extension

Java Virtual Machine (JVM)
- interprets the byte code into the proper machine language for the operating system
- After translation, the applet is executed and appears on the Web page.

## Adding a Java Applet to a Web Page

OBSOLETE: the applet element

HTML5: the object element

```
<object type="application/x-java-applet" width="610" height="30"
title="This Java Applet displays a message">
<param name="code" value="example.class">
<param name="textColor" value="#FF0000">
<param name="message" value="This is a Java Applet">
<param name="backColor" value="#FFFFFF">
Java Applets can be used to display text, manipulate graphics, play
games, and more.
Visit <a href="http://download.oracle.com/javase/tutorial/">Oracle</a>
for more information.
</object>
```

## Checkpoint

1. Describe a benefit of using the new HTML5 video and audio elements.
2. Describe the purpose of the transform property.
3. Describe a disadvantage of using Java applets on web pages.

## What is JavaScript?

- Object-based  client-side scripting language
- Originally developed by Brendan Eich at Netscape
- JavaScript is NOT Java
- Manipulates the objects associated with a web page document:
  - the window
  - the document
  - the elements such as forms, images, hyperlinks, and so on

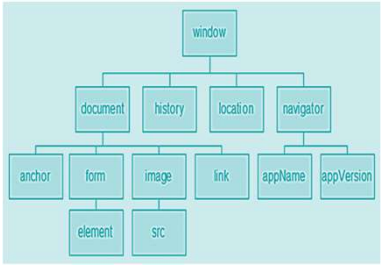
 

## Common Uses of JavaScript

- Display a message box
- Select list navigation
- Edit and validate form information
- Create a new window with a specified size and screen position
- Image Rollovers
- Status Messages
- Display Current Date
- Calculations

## Document Object Model (DOM)




A portion of the DOM is shown at the left.

Defines every object and element on a Web page

Hierarchical structure

Accesses page elements and apply styles to page elements

## What is Ajax?

- Asynchronous JavaScript and XML
- "Ajax" – Jesse James Garrett at Adaptive Path
- Existing technologies used in a new way
  - Standards-based XHTML and CSS
  - Document Object Model
  - XML (and the related XSLT technology)
  - Asynchronous data retrieval using XMLHttpRequest
  - JavaScript
- Very Basic Example:
  - http://webdevfoundations.net/css

## Exploring JQuery

A JavaScript library intended to simplify client-side scripting

Example: http://webdevfoundations.net/jquery

API – Application Programming Interface
- A protocol that allows software components to communicate – interacting and sharing data.


The jQuery API can be used to configure many interactive features, including:
- image slideshows
- animation (moving, hiding, fading)
- event handling (mouse movements and mouse clicking)
- document manipulation
- Ajax

## HTML5 APIs

API – a protocol that allows software components to communicate – interacting and sharing data

A variety of APIs that are intended to work with HTML5, CSS, and JavaScript are currently under development and in the W3C approval process, including:
- geolocation
- web storage
- offline web applications
- canvas

## HTML5 Geolocation

Allows your web page visitors to share their geographic location

Their location may be determined by the IP address, wireless network connection, local cell tower, or GPS hardware depending on the type of device and browser.

JavaScript is used to work with the latitude and longitude coordinates provided by the browser.

Examples:
- http://webdevfoundations.net/geo and http://html5demos.com/geo

## HTML5 Web Storage

Traditionally, the JavaScript cookie object has been used to store information in key-value pairs on the client (the website visitor's computer).

NEW FOR HTML5: Web Storage API

- provides two new ways to store information on the client side: local storage and session storage.
- Advantage: increase in the amount of data that can be stored (5MB per domain).
- The **localStorage** object stores data without an expiration date.
- The **sessionStorage** object stores data only for the duration of the current browser
- JavaScript is used to work with the values stored in the localStorage and sessionStorage objects.

Examples:

- http://webdevfoundations.net/storage and http://html5demos.com/storage

## HTML5 Offline Web Applications

An **offline web application** enables website visitors to view documents and access web applications even when they are not connected to the Internet.

A web application (app) can be written with HTML, CSS and JavaScript and can run in any browser – as long as you are online.

An offline web application takes this one step further and stores the HTML, CSS, and JavaScript files on the visitor's device for use offline, even when the device is not connected to the Internet.

Examples:

- http://html5demos.com/offlineapp
- http://www.w3schools.com/html/html5_app_cache.asp

## HTML5 Canvas Element

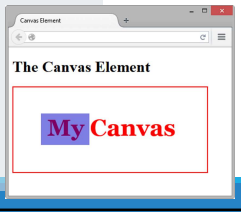
Configures dynamic graphics

- Draw lines, shapes, text, image
- Interact with actions taken by the user

Canvas API (application programming interface)

JavaScript – client-side scripting language

```
<script type="text/javascript">
function drawMe() {
  var canvas = document.getElementById("myCanvas");
  if (canvas.getContext) {
    var ctx = canvas.getContext("2d");
    ctx.fillStyle = "rgb(255, 0, 0)";
    ctx.font = "bold 3em Georgia";
    ctx.fillText("My Canvas", 70, 100);
    ctx.fillStyle = "rgba(0, 0, 200, 0.50)";
     ctx.fillRect (57, 54, 100, 65);
  }
}
</script>
```



## Checkpoint

1. Describe two uses of JavaScript.
2. Describe two technologies used in Ajax.
3. Describe the purpose of the HTML5 canvas element.

## Multimedia & Accessibility

- Provide links to plug-ins
- Provide text descriptions and captions
- Verify keyboard access
- Check for screen flickering
- Verify functionality if JavaScript is disabled
- If media is used for main navigation, provide plain text links

## Summary

This chapter introduced the HTML & CSS techniques and technologies used to configure sound, video, and interactivity on web pages.

Issues related to accessibility and copyright were also discussed.

The number one reason for visitors to leave web pages is too long of a download time. When using multimedia, be careful to minimize this issue.