

HTML 5 and CSS 3, Illustrated Complete

Unit K: Incorporating Video and Audio

UNIT
K

HTML5 and CSS3



Objectives

- Understand Web video and audio
- Use the video element
- Incorporate the source element
- Control playback

Objectives (continued)

- Add video support for older browsers
- Provide a fallback image
- Implement the audio element
- Add audio support for older browsers

Understanding Web Video and Audio

- Video and audio are widespread
 - Need to make choices on how to incorporate video and audio into Web pages
- Encoding: transforming moving image and/or sound into a digital file
 - Each encoding method known as codec
 - Main video codecs: H.264, Theora, and VP8
 - Main audio codecs: AAC, MP3, and Vorbis

Understanding Web Video and Audio (continued)

- Stream: encoded set of video or audio data
- Container: file that contains a video stream
 - May contain accompanying audio stream
 - e.g., MPEG-4, Ogg, WebM, Flash Video
 - Each container commonly used with specific audio codec and specific video codec

Understanding Web Video and Audio (continued)

- Helper program: program that can unpack container and decode video and audio streams
 - Also known as plugin
 - Users often need to download appropriate software packages
- Not all browsers natively support containers and codecs
 - Web developers must take steps to ensure usability when publishing media

Using the video Element

- <video> element: used to add video to a Web page
 - Only works in HTML5
 - Attributes indicate how video is presented to users of the Web page
 - src: specifies video file to display
 - width and height: dimensions of the video element within Web page
 - type: specifies container format and codecs used to encode the file
 - Container format expressed using MIME type

Using the video Element (continued)

- Code containing video element

Opening and
closing video
tags added

```
<article id="content">
  <h2 id="main">Events</h2>
  <p>don't have a specific date in mind for your getaway? explore seasonal experiences and special events you won't
  want to miss!</p>
  <section>
    <h3>Butterfly Season</h3>
    <p class="eventdate">June and July</p>
    <video src="media/bfly.m4v" width="320" height="240" type="video/mp4; codecs="avc1.42E01E, mp4a.40.2">
    </video>
    <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a
    region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland
    Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July
    peak.</p>
  </section>
  <section>
    <h3>Accordion Rendezvous</h3>
    <p class="eventdate">last weekend in September</p>
    <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come
    to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  </section>
</article>
```

type value
describes
container
format, video
codec, and
audio codec

Incorporating the source Element

- Not all browsers support all containers
- <source> element: used to specify a media file to be displayed
 - Multiple source elements can be nested within HTML5 elements
 - Can be used to reference multiple video files each specifying the same video in different container and encoding formats
 - Dimensions of the video still set in video tag attributes

Incorporating the source Element (continued)

- Code containing multiple source elements nested within a video element

source elements
added for three
files in different
container
formats and
encoded using
different codecs

```
<article id="content">
  <h2 id="main">Events</h2>
  <p>Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't
  want to miss!</p>
  <section>
    <h3>butterfly season</h3>
    <p class="eventdate">june and july</p>
    <video width="320" height="240">
      <source src="media/bfly.m4v" type="video/mp4; codecs="avc1.42E01E, mp4a.40.2" />
      <source src="media/bfly.webm" type="video/webm; codecs="vp8, vorbis" />
      <source src="media/bfly.ogv" type="video/ogg; codecs="theora, vorbis" />
    </video>
    <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a
    region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland
    reads' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late june/early july
    peak.</p>
  </section>
  <section>
    <h3>Accordion Rendezvous</h3>
    <p class="eventdate">last weekend in September</p>
    <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. come
    to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  </section>
</article>
```

Controlling Playback

- Attributes of the video element provide control over how element is displayed and how user interacts with video
 - controls: instruct browser to add default controls to the video element
 - preload: when browser should download the video
 - loop: restart playback when end of video is reached
 - autoplay: start playback when page is loaded

Controlling Playback (continued)

● Code for adding video controls

```
<article id="content">
  <h2 id="main">Events</h2>
  <p>Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!</p>
  <section>
    <h3>Butterfly Season</h3>
    <p class="eventdate">June and July</p>
    <video width="320" height="240" controls="controls">
      <source src="media/bfly.m4v" type="video/mp4; codecs="avc1.42E01E, mp4a.40.2" />
      <source src="media/bfly.webm" type="video/webm; codecs="vp8, vorbis" />
      <source src="media/bfly.ogv" type="video/ogg; codecs="theora, vorbis" />
    </video>
    <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.</p>
  </section>
  <section>
    <h3>Accordion Rendezvous</h3>
    <p class="eventdate">last weekend in September</p>
    <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  </section>
</article>
```

XHTML-compatible attribute-value pair
for displaying video controls

Controlling Playback (continued)

- Video controls rendered in different browsers

The diagram illustrates two different video player skins. The top player, titled "Events", has a header with the text "Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!". Below this is a section titled "Butterfly Season" with the subtitle "June and July". A red arrow points from the text "Play/pause buttons" to the play button in the video player. The bottom player, titled "Events", also has the same introductory text. It features a section titled "Butterfly Season" with the subtitle "June and July", followed by a paragraph about Minnesota's butterfly habitat. Below this is a section titled "Accordion Rendezvous" with the subtitle "last weekend in September", followed by a paragraph about a squeezebox gathering. A red arrow points from the text "Sliders for moving around within video" to the progress bar in the video player. Another red arrow points from the text "Volume controls" to the volume icon in the video player. A third red arrow points from the text "Sliders for moving around within video" to the volume icon in the video player. A fourth red arrow points from the text "Volume controls" to the volume icon in the video player.

Events

Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!

Butterfly Season

June and July

Events

Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!

Butterfly Season

June and July

Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.

Accordion Rendezvous

last weekend in September

Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.

Play/pause buttons

Sliders for moving around within video

Volume controls

Adding Video Support for Older Browsers

- Older browsers do not recognize HTML5 elements
 - You can add support for older browsers while maintaining HTML5 features for browsers that support it
- To make video available, use object and param elements
 - object element defines video type / data
 - param elements define settings of the video

Adding Video Support for Older Browsers (continued)

- Code for browsers supporting the Adobe Flash version of the video

object and
param elements
specify attributes
and settings for
Flash Player

```
<article id="content">
  <h2 id="main">Events</h2>
  <p>Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!</p>
  <section>
    <h3>Butterfly Season</h3>
    <p class="eventdate">June and July</p>
    <video width="320" height="240" controls="controls">
      <source src="media/bfly.m4v" type="video/mp4; codecs="avc1.42E01E, mp4a.40.2" />
      <source src="media/bfly.webm" type="video/webm; codecs="vp8, vorbis" />
      <source src="media/bfly.ogv" type="video/ogg; codecs="theora, vorbis" />
      <object type="application/x-shockwave-flash" data="media/bfly.swf" width="320" height="240">
        <param name="movie" value="media/bfly.swf" />
        <param name="wmode" value="opaque" />
        <param name="loop" value="false" />
        <param name="play" value="false" />
      </object>
    </video>
    <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.</p>
  </section>
  <section>
    <h3>Accordion rendezvous</h3>
    <p class="eventdate">last weekend in September</p>
    <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  </section>
</article>
```


Adding Video Support for Older Browsers (continued)

● Video displayed in Flash Player

Events

- Home
- About Us
- Rooms
- Reservations
- Events
- Local Weather
- Directions

Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!

Butterfly Season


June and July

Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.

Accordion Rendezvous

last weekend in September

Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short,



00:00:00:00

Video/Sasha Vodnik

Controls are embedded within Flash Player video and are displayed the same way across browsers

Providing a Fallback Image

- It is likely that some potential viewers will be unable to view video content
- To preserve layout of Web page video and object element allow you to specify a fallback image
 - Gives users a taste of the content in the video
 - For video tag, use poster attribute
 - For object tag, create a nested img tag

Providing a Fallback Image (continued)

- Code for providing a fallback image

Embedded
img element
specifies
fallback image
for browsers
that don't
support the
video element

```
<article id="content">
  <h2 id="main">Events</h2>
  <p>Don't have a specific date in mind for your getaway? Explore seasonal experiences and special events you won't want to miss!</p>
  <section>
    <h3>Butterfly Season</h3>
    <p class="eventdate">June and July</p>
    <video width="320" height="240" controls="controls" poster="images/bfly.png">
      <source src="media/bfly.m4v" type="video/mp4; codecs="h264, mp4a, aac" />
      <source src="media/bfly.webm" type="video/webm; codecs="vp8, vorbis" />
      <source src="media/bfly.ogv" type="video/ogg; codecs="theora, vorbis" />
      <object type="application/x-shockwave-flash" data="media/bfly.swf" width="320" height="240">
        <param name="movie" value="media/bfly.swf" />
        <param name="wmode" value="opaque" />
        <param name="loop" value="false" />
        <param name="play" value="false" />
        
      </object>
    </video>
    <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.</p>
  </section>
  <section>
    <h3>Accordion Rendezvous</h3>
    <p class="eventdate">last weekend in September</p>
    <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  </section>
</article>
```

poster attribute specifies
fallback image for
browsers that support the
video element

Implementing the audio Element

- <audio> element: HTML5 element for linking audio files to a Web page and enabling user to control playback
 - Takes the same attributes as the video element
 - Accepts nested source elements for source files in multiple formats
- Important to display the controls because without them, audio element is invisible on the Web page

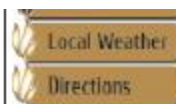
Implementing the audio Element (continued)

- audio and source elements: code and result

audio and
source
elements
specify settings
and source
files

```
<article id="content">
  <h2 id="main">events</h2>
  <p>don't have a specific date in mind for your getaway? explore seasonal experiences and special events you won't want to miss!</p>
  <section>
    <h3>Butterfly Season</h3>
    <p class="eventdate">June and July</p>
    <video width="320" height="240" controls="controls" poster="images/bfly.png">
      <source src="media/bfly.m4v" type="video/mp4; codecs="avc1.42E01E, mp4a.40.2" />
      <source src="media/bfly.webm" type="video/webm; codecs="vp8, vorbis" />
      <source src="media/bfly.ogv" type="video/ogg; codecs="theora, vorbis" />
      <object type="application/x-shockwave-flash" data="media/bfly.swf" width="320" height="240">
        <param name="movie" value="media/bfly.swf" />
        <param name="wmode" value="opaque" />
        <param name="loop" value="false" />
        <param name="play" value="false" />
      </object>
    
  </video>
  <p>Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.</p>
</section>
<section>
  <h3>Accordion Rendezvous</h3>
  <p class="eventdate">last weekend in September</p>
  <p>Lovers of the squeezebox gather every year in the twin lakes area to share songs and play music together. come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  <audio controls="controls">
    <source src="media/bonfire.mp3" type="audio/mpeg" />
    <source src="media/bonfire.ogg" type="audio/ogg; codecs="vorbis" />
  </audio>
</section>
</article>
```

Audio controls
match functions
and appearance
of video controls



bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.

Accordion Rendezvous

last weekend in September

Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.



Adding Audio Support for Older Browsers

- Not all older browsers recognize the HTML5 audio tag
- Use an object element and nested param elements to specify fallback content
 - Just like you would use for fallback video
 - Even though a file contains no video, its location is indicated using the “movie” parameter

Adding Audio Support for Older Browsers (continued)

- Code incorporating fallback version of audio and resulting page

object and
param elements
specify
attributes and
settings for
Flash Player

```
<section>
  <h3>Accordion Rendezvous</h3>
  <p class="eventdate">last weekend in september</p>
  <p>Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.</p>
  <audio controls="controls">
    <source src="media/bonfire.mp3" type="audio/mpeg" />
    <source src="media/bonfire.ogg" type="audio/ogg; codecs="vorbis" />
    <object type="application/x-shockwave-flash" data="media/bonfire.swf" width="320" height="30">
      <param name="movie" value="media/bonfire.swf" />
      <param name="wmode" value="opaque" />
      <param name="loop" value="false" />
      <param name="play" value="false" />
    </object>
  </audio>
</section>
```

events you



June and July

Minnesota plays host to a variety of beautiful butterflies in high summer. As a result of our participation a region-wide effort to increase butterfly habitat by planting more native bushes and shrubs, more butterflies visit Lakeland Reeds' gardens each year. The video shows one of our butterfly-friendly bushes covered during a typical late June/early July peak.

Accordion Rendezvous

last weekend in September

Lovers of the squeezebox gather every year in the Twin Lakes area to share songs and play music together. Come to play or just to listen. The audio clip below features a short, energetic tune by our own Phillip Blaine.



Summary

- Media files can be included in a Web page, provided that you take into consideration:
 - Encoding and container formats
 - Inclusion of helper programs and plugins
 - Providing support for older browsers
- Video is added using `<video>` element
 - Attributes specify how video is displayed and how user interacts with the video

Summary (continued)

- source elements allow you to provide multiple copies of the file in different formats
- Various attributes of video element enable control of video playback
- Video support for older browsers is added using object and param elements

Summary (continued)

- Fallback image can be provided
 - For video tag, use the poster attribute
 - For object tag, nest an img tag before closing object tag
- Audio is added using the audio element
 - Similar attributes to video element
- Use object and param elements to provide audio support for old browsers