

HTML5 and CSS3 Complete

Second Edition

Unit L

Incorporating Video and Audio

Objectives

- Assess web video and audio
- Use the `video` element
- Control playback
- Incorporate the `source` element



Objectives (continued)

Unit L

- Add video support for older browsers
- Provide poster and fallback images
- Make videos accessible
- Implement the `audio` element

Assess Web Video and Audio

Unit L

- Video  and audio  are widespread

➤ So we need to make choices on how to incorporate video and audio into web pages



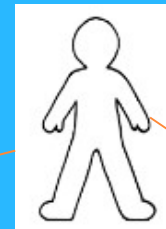
Why do you need to incorporate videos on your website?

1. Some people have short attention span.



Attention span for a goldfish
Is 9 seconds.

2. Creates website experience



3. Keeps visitors on your site longer.

This web site no longer exists

Assess Web Video and Audio



Video and audio can be encoded in many different ways, and new ways are constantly being developed.

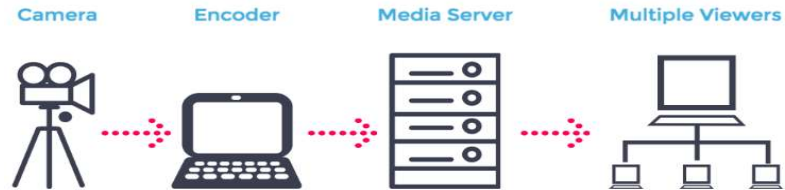
- **Encoding: transforming moving image and/or sound into a digital file**

➤ Each encoding method known as **codec** (coder/decoder)

- Main video codecs: H.264, Theora, VP8, VP9
- Main audio codecs: AAC, MP3, Opus, Vorbis

Assess Web Video and Audio (continued)

- **Stream**: encoded set of video data



- **Container**: file that contains a video stream

- May contain accompanying audio stream
- Popular container formats: MPEG-4, Ogg, WebM, Flash Video
- Each container commonly used with 1 or 2 specific audio codecs and specific video codecs

Format Container: W3C

Unit L

Format Container: .avi, .mp4, .mov, .ogg, .flv, .mkv, etc.			
Video codec:	Audio codec:	Captioning, Video description:	Metadata:
H.264, VC-1, Theora, Dirac 2.1, H.263, etc.	AAC, WMA, Vorbis, PCM, etc.	SAMI, SMIL, Hi-Caption, CMML, DXFP, 3GPP TS 26.245, MPSub, etc.	Author, Title, Location, Date, Copyright, License, etc.

- **Container** can contain different types of media (video/audio), captions, and meta data about the file. **File Format = Container Format**
- The contents of this container, **you will normally have at least one video and one audio track** – **STREAM**

SUMMARY:

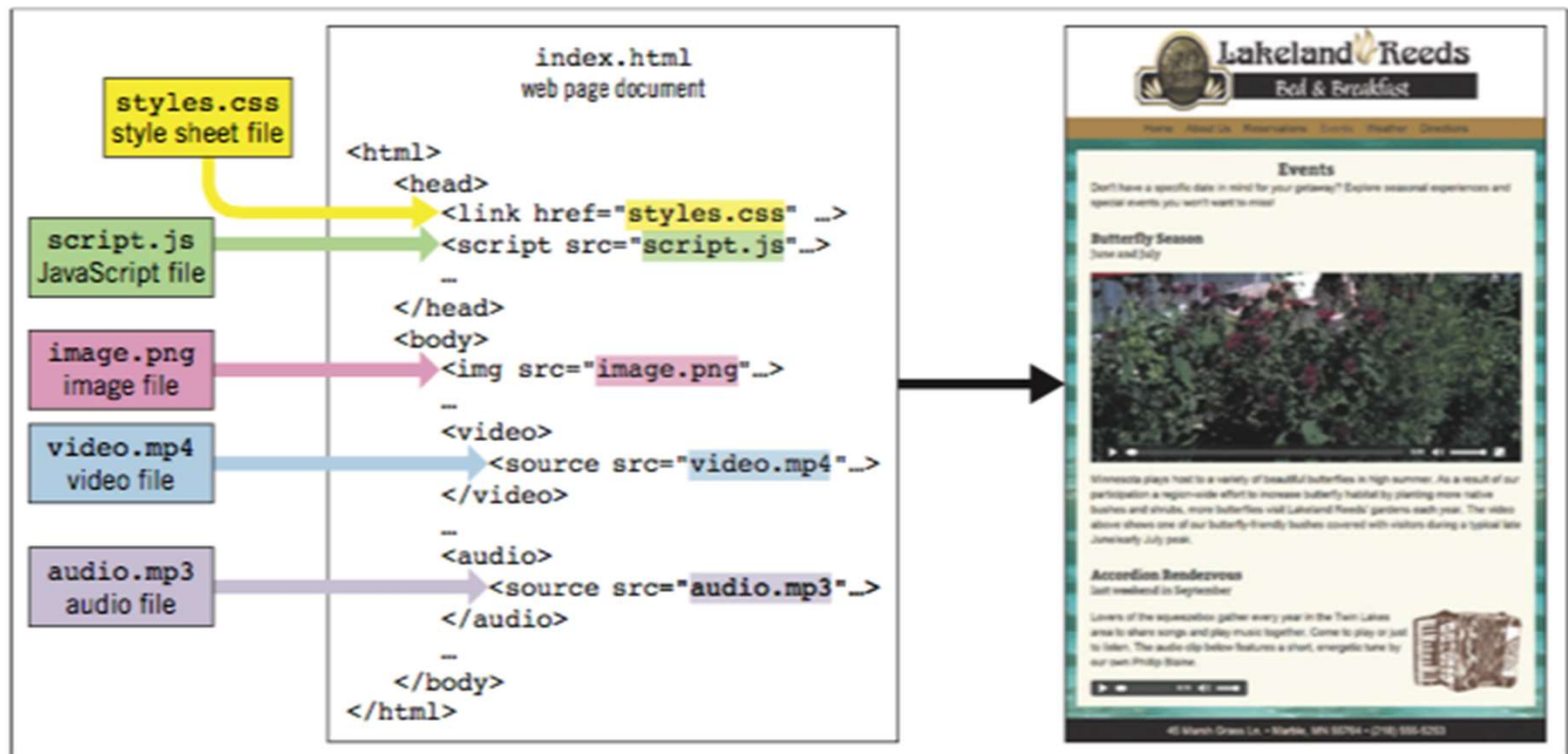
CONTAINER – wrapper, i.e., .avi container is very limited, you can only have one audio stream and one video stream

Assess 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

Assess Web Video and Audio (continued) demo1.zip

- Relationship between video files, audio files, and other web page



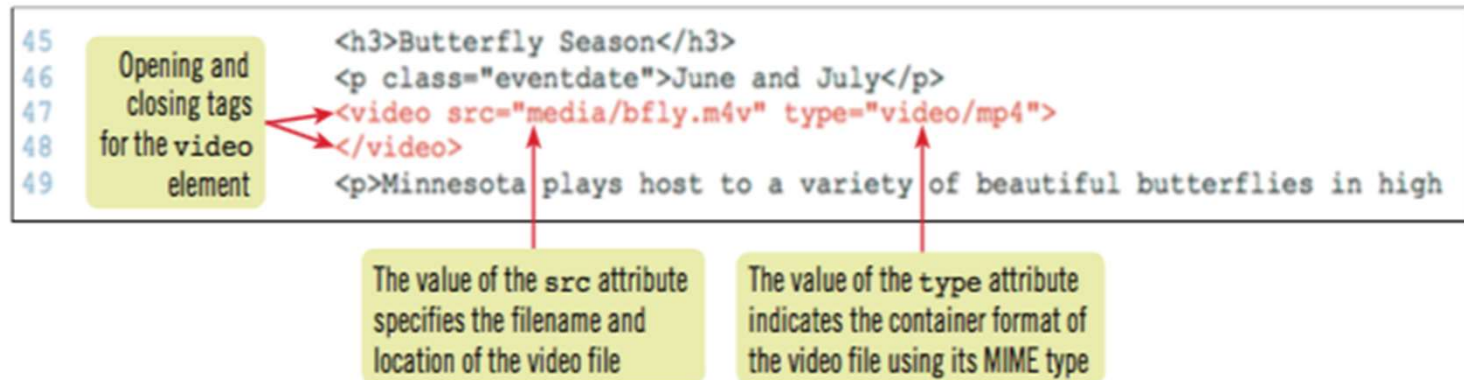
Use the video Element

Unit L

- video element: used to add video to a web page
 - type attribute specifies container format
 - MIME type: a standardized value used to reference a data type. The Internet Assigned Numbers Authority (IANA) is the official body responsible to keeping track of all official MIME types
 - Complete List of MIME Type:
<https://www.sitepoint.com/mime-types-complete-list/>

Video Element Example

Unit L



1. MIME – determined by browsers how to process a document.

2. **Syntax: General Structure:**

type/subtype

3. **Images Type:** Only a handful of image types are widely recognized/considered safe – image/gif, image/jpeg, image/png, image/svg+xml

4. **Audio Type:** Only few are used on the web – audio/wave, audio/webm, etc.

text/plain
text/html
image/jpeg
image/png
audio/mpeg
audio/ogg
audio/*
video/mp4

Control Playback

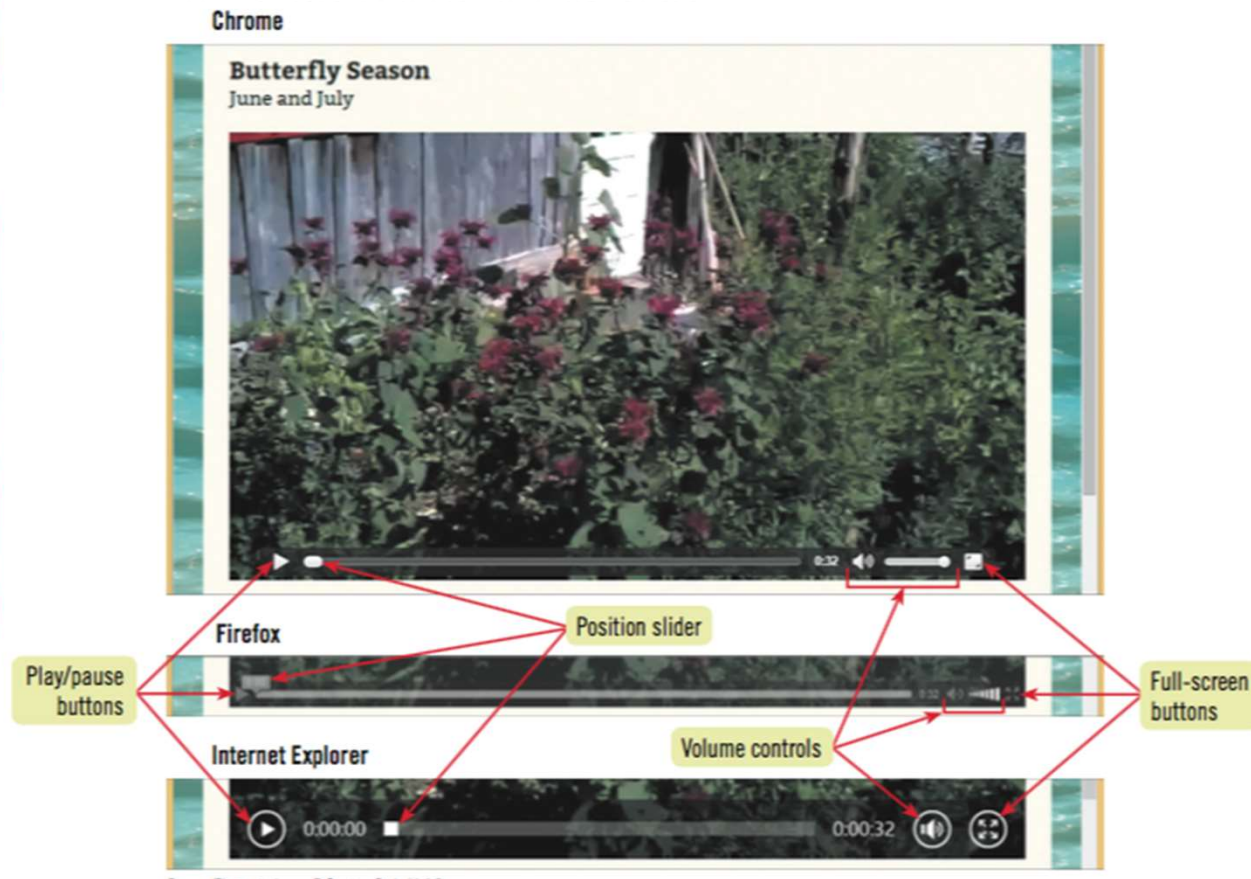
Unit L

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

Control Playback (continued) Unit L

- controls attribute and results

```
45      <h3>Butterfly Season</h3>
46      <p class="eventdate">June and July</p>
47      <video src="media/bfly.m4v" type="video/mp4" controls>
48      </video>
```



Incorporate the source Element

- Modern browsers support MPEG-4 with H.264, but some may be optimized for other formats
- source element: used to specify a media file to be displayed
 - Multiple `source` elements can be nested within a `video` element
 - Can be used to reference multiple video files each specifying the same video in different container and encoding formats

Incorporate the source Element (continued)

- Your browser does not support the video tag. demo2.zip

```
<section>
  <h3>Butterfly Season</h3>
  <p class="eventdate">June and July</p>

  <video controls poster="images/bfly.png">
    <source src="media/bfly.m4v" type="video/mp4">
    <source src="media/bfly.webm" type="video/webm">
  </video>
  <p>Minnesota plays host to a variety of beautiful butterfl
</section>
<section>
  <h3>Accordion Rendezvous</h3>
  <p class="eventdate">last weekend in September</p>
  <figure>
    
  <p>Lovers of the squeezebox gather every year in the Twin
  <audio controls>
    <source src="media/bonfire.mp3" type="audio/mpeg">
    <source src="media/bonfire.ogg" type="audio/ogg">
  </audio>
</section>
```

Video Format Converter:

http://www.freemake.com/free_video_converter/



Add Video Support for Older Browsers

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- 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 Flash version available, use `object` and `param` elements
 - `object` element defines video type
 - `param` elements define settings for the video

Add Video Support for Older Browsers (continued)

Unit L

```
45      <h3>Butterfly Season</h3>
46      <p class="eventdate">June and July</p>
47      <video controls>
48          <source src="media/bfly.m4v" type="video/mp4">
49          <source src="media/bfly.webm" type="video/webm">
50          <object type="application/x-shockwave-flash" width="854" height="508">
51              <param name="movie" value="media/bfly.swf">
52              <param name="base" value="media">
53          </object>
54      </video>
```

object and param elements specify attributes and settings for Flash Player

- Some older browsers that do not recognize HTML5 elements, such as video and source.
- HTML5 allows you to incorporate support for video that works for users of older browsers while maintaining the benefits of HTML5 video for browsers that support it.
- Older browsers rely on additional software, such as Adobe Flash, to play videos

Add Video Support for Older Browsers (continued)

Unit L

- Video displayed in Flash Player:



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



Class Activities

Unit L

Have you had problems playing media files on these browsers?
How, if at all, did they fix the problems?

Provide Poster and Fallback Images

Unit L

- Before a users plays a video, the first frame is displayed
 - Can customize by specifying a poster image
- It is likely that some potential viewers will be unable to view video content
 - To preserve layout of web page, specify a fallback image
 - Created by nesting an `img` element within the `video` element

Provide Poster and Fallback Images (continued)

Unit L

- Code for poster and fallback images:

```
45      <h3>Butterfly Season</h3>
46      <p class="eventdate">June and July</p>
47      <video controls poster="images/bfly.png">
48          <source src="media/bfly.m4v" type="video/mp4">
49          <source src="media/bfly.webm" type="video/webm">
50          <object type="application/x-shockwave-flash" width="854" height="508">
51              <param name="movie" value="media/bfly.swf">
52              <param name="base" value="media">
53              
55          </object>
56      </video>
```

The poster image is specified with the poster attribute

The fallback image is specified with an img element nested within the object element

Poster="images/bfly.png"

Is the fallback image for modern browsers.

Note: Check demo2.zip and view the source code.

Fallback Image

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What are the criteria for selecting a fallback image? What kind of information should the fallback image display?



~~Plan A~~

Plan B

Make Videos Accessible

Unit L

- Make videos accessible by accompanying with text content
- Captions: text overlaid on video image that describes audio portion
 - For users who are deaf/hard of hearing
- Descriptions: words that explain what is happening in the video
 - For users who are blind or have low sight
 - Can be read by screen reader

Make Videos Accessible (continued)

- Captions and descriptions written in WebVTT
 - Markup language for creating text tracks to accompany video
 - Consists of cues: unique name, time range, and associated text
- Use `track` element to link caption and description files to web page

Make Videos Accessible (continued)

Unit L

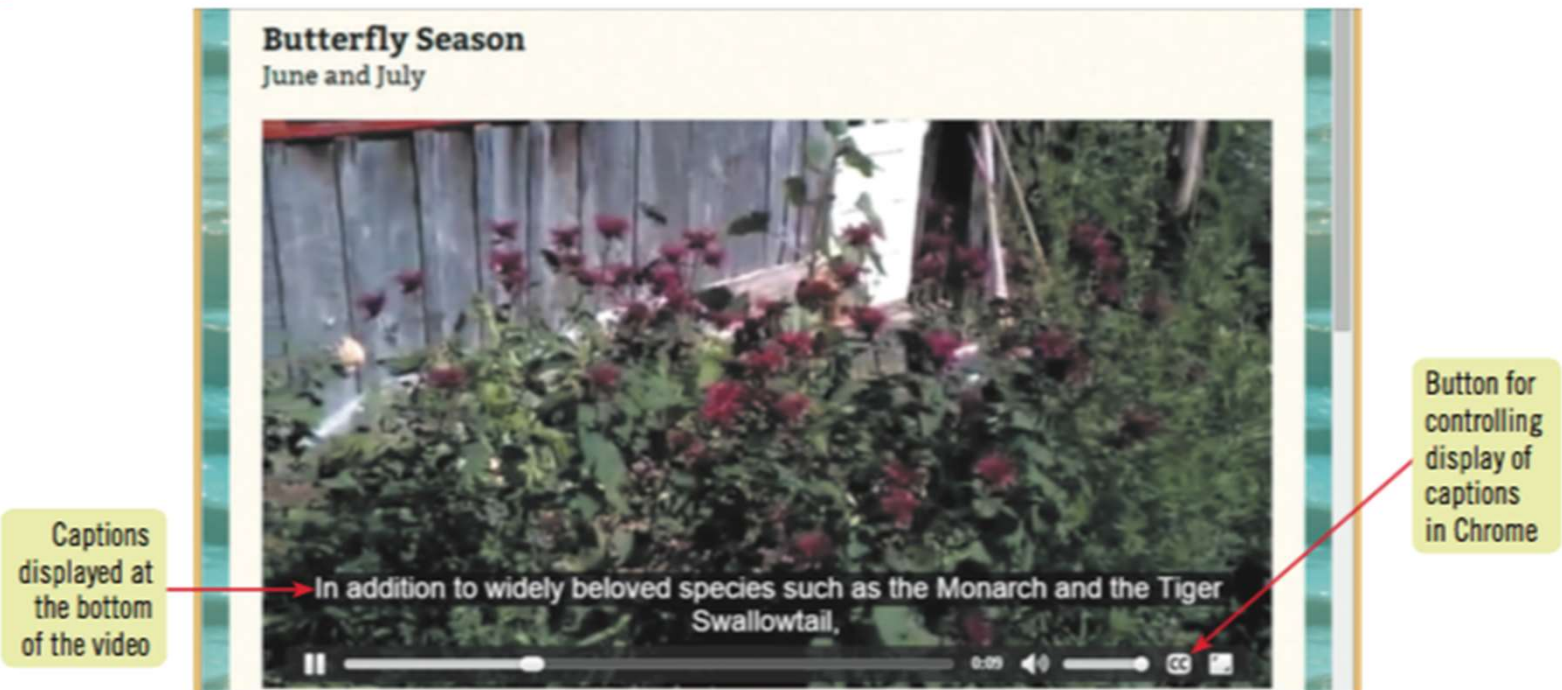
- Code for description file and `track` element

```
1 WEBVTT FILE ← First line must consist of WEBVTT FILE
2
3 NOTE
4 Lakeland Reeds Butterfly Season video descriptions
5 Filename: descriptions.vtt
6 Author:
7 Date:
8 HTML5 and CSS3 Illustrated Unit L, Lessons
9
10 1 ← Cue name
11 00:00.000 --> 00:31.000 ← Cue time range
12 A bush with purple flowers is covered with many dark butterflies, some of which slowly
13 beat their wings. ← Cue text
```

```
47 <video controls poster="media/bfly.jpg" type="video/mp4" ← kind value of descriptions specifies text descriptions of visual content
48 <source src="media/bfly.m4v" type="video/mp4" /
49 <source src="media/bfly.webm" type="video/webm">
50 <track src="descriptions.vtt" kind="descriptions" srclang="en"
51 label="English descriptions">
52 <track src="captions.vtt" kind="captions" srclang="en"
53 label="English captions"> ← kind value of captions specifies text transcript of audio content
54 <object type="application/javascript" src="media/js/bfly.js">
```

Make Videos Accessible (continued) demo3.zip

- Video captions displayed during playback



Implement the `audio` Element

- `audio` element: element for linking audio files to a web page and enabling users to control playback
 - Takes same attributes as `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

Common Audio MIME Types

Unit L

File Extension	MIME Type
au	audio/basic
snd	audio/basic
Linear PCM	audio/L24
mid	audio/mid
rmi	audio/mid
mp3	audio/mpeg
mp4 audio	audio/mp4
aif	audio/x-aiff
aifc	audio/x-aiff
aiff	audio/x-aiff
m3u	audio/x-mpegurl
ra	audio/vnd.rn-realaudio
ram	audio/vnd.rn-realaudio
Ogg Vorbis	audio/ogg
Vorbis	audio/vorbis
wav	audio/vnd.wav

HTML5:

If the browser doesn't support the element or the file type, it'll kick back an error message.

Using *audio* allows the browser itself to play back supported sound files without the need for a plugin.

Implement the audio

Element: demo4_audio.zip

- audio and source elements: code and result

```

67      <section>
68      <h3>Accordion Rendezvous</h3>
69      <p class="eventdate">last weekend in September</p>
70      <figure>
71      
72      </figure>
73      <p>Lovers of the squeezebox gather every year in the Twin Lakes area to
74      share songs and play music together. Come to play or just to listen. The
75      audio clip below features a short, energetic tune by our own Phillip
76      Blaine.</p>
77      <audio controls>
78      <source src="media/bonfire.mp3" type="audio/mpeg">
79      <source src="media/bonfire.ogg" type="audio/ogg">
80      <object type="application/x-shockwave-flash" width="320" height="30">
81      <param name="movie" value="media/bonfire.swf">
82      <param name="base" value="media">
83      </object>
84      </audio>
85      </section>

```

The audio element adds audio content to a web page

source elements specify audio source files

The object element specifies Flash content for older browsers

Position slider

Volume controls

Play/pause button

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- 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)

Unit L

- `source` elements allow you to provide multiple versions 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)

- Poster image can be provided using the `poster` attribute of the `video` tag
- Fallback image can be provide by nesting an `img` element within the `video` element
- Add captions and descriptions by creating WebVTT files
- Audio is added using the `audio` element