

HTML5 - WHAT SHOULD I BE TEACHING?

Mark DuBois
Oct. 14, 2010



**EDUCATION
LEADER**



Disclaimer

- HTML5 is a work in progress
 - Not yet an official W3C recommendation
 - This information is current as of mid-September, 2010 (subject to change)

Disclaimer (2)

- Ian Hickson (Google) [editor of HTML5 specification]
 - 2012 **may** reach candidate recommendation stage
 - 2022 **proposed** recommendation
 - That's **19 years** from start of project (2003)

Disclaimer (3)

- This presentation is not about specific elements, attributes
- HTML5 is emerging rapidly
 - Even though it is not a formal recommendation
 - Fair amount of “paving of cow paths”
- Focus is on what parts should we convey to our students

My Background



- Working with HTML since 1992
- Established oldest accredited degree in Web Systems (1999)
- Invited expert HTML5 Working Group of W3C
- Member Open Web Education Alliance (W3C incubator group)
- Gave day long pre-conference seminar at 17th WWW Conference (Beijing, 2008)
 - Web 2.0 Best Practices
- Director of Education, World Organization of Webmasters
- Presently teach 17 different classes on various aspects of Web Systems (not all at same time)
 - Keeping these up to date is an ongoing challenge

Agenda

- Overview
- Features
- What can I use today
- Suggestions for incorporating
- Tools

HTML5

HTML Recommendations

Version	Reference	Sections	Sub-Sections
HTML 2	http://www.w3.org/MarkUp/html-spec/html-spec_toc.html	10	~ 100
HTML 3.2	http://www.w3.org/TR/REC-html32	10	< 50
HTML 4.01	http://www.w3.org/TR/html401/	24	400+
XHTML 1	http://www.w3.org/TR/xhtml1/	10	~ 50
XHTML 1.1	http://www.w3.org/TR/xhtml11/	7	~15
HTML 5	http://www.w3.org/TR/html5/	12	800+

Agenda

- Overview
- **Features**
- What can I use today
- Suggestions for incorporating
- Tools

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- Web sockets
- Offline web applications
- Microdata

Features – deprecated elements

- Dichotomy
 - Developers should not be using
 - User agents still need to support (backwards compatibility)
- Given that these elements are going away, we should insist students not use them (focus on web standards)
 - Presentational elements
 - Infrequently used elements (or alternate elements)
 - Elements with Accessibility issues
 - Many attributes
- What follows is not a complete list

Deprecated Presentational Elements

- `<basefont>` - defines default font, color or size on a page
- `<big>` - defines big text
- `<center>` - defines centered text
- `` - defines font, color, size
- `<s>` - defines strikethrough text
- `<small>` - defines small text
- `<strike>` - defines strikethrough text
- `<tt>` - defines teletype text
- `<u>` - defines underlined text

Use CSS instead

Deprecated Infrequently Used Elements

- `<acronym>` - defines an acronym
- `<applet>` - defines embedded applet (often Java)
- `<dir>` - defines a directory list
- `<isindex>` - defines searchable index related to document

Deprecated Elements - Accessibility

- `<frame>` - define a window in a frameset
- `<frameset>` - defines a set of frames
- `<noframes>` - defines alternate content for user agents that do not support frames

Deprecated Attributes

Element	Deprecated Attribute(s)
All block level elements	align
<a>, <link>	charset, rev
<body>	background, bgcolor
	longdesc, name, hspace, vspace
<table>	bgcolor, border, cellpadding, cellspacing, align
<td>, <th>	height, width, abbr, scope, valign, bgcolor
<tr>	align, bgcolor, valign



Students need to understand...

DO NOT USE THESE

Features

- Deprecated elements and attributes
- **New elements (structural, audio, video, canvas)**
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- Web sockets
- Offline web applications
- Microdata

Features – New Structural Elements

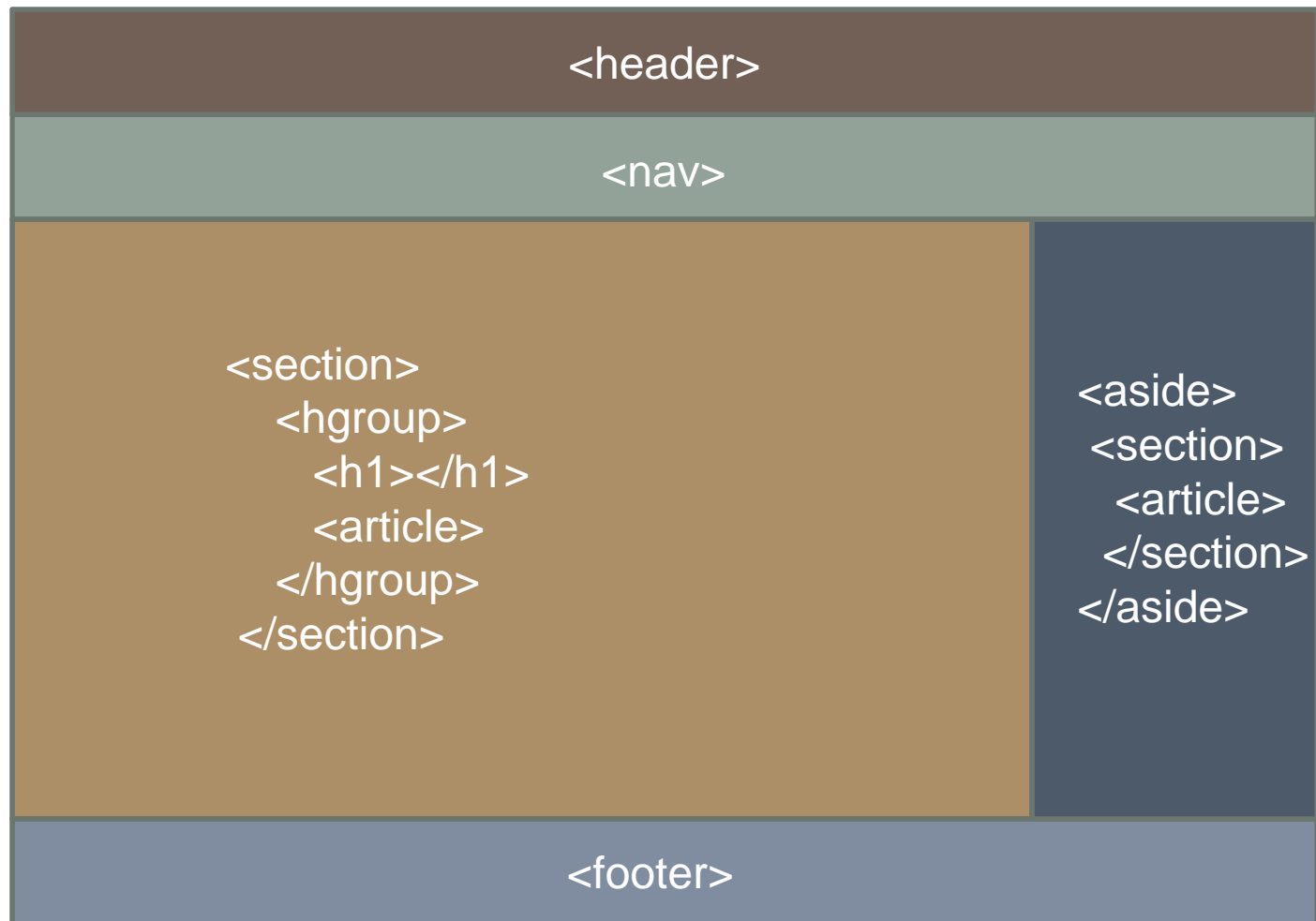
<section>

“The section element represents a **generic section of a document** or application. A section, in this context, is a thematic grouping of content, typically with a heading.”

“Examples of sections would be **chapters**, the various tabbed pages in a tabbed dialog box, or the numbered sections of a thesis. A Web site's home page could be split into sections for an introduction, news items, contact information.”

<http://www.w3.org/TR/html5/sections.html#the-section-element>

Page Structure



Importance today

- Students need to begin thinking of pages and their structure
- Consider developing a table of contents for the page
- `<body>` element would be the outline root
- Each `<section>` and related elements provide a structure
- Recommend get students in habit of outlining their pages (and the content to be presented)

New Elements - Outline

- Students should think of overall page structure and create outline
 - Can check page with HTML5 Outliner
 - <http://gsnedders.html5.org/outliner/>
 - Note outline of page on right
 - Some structure there, but other pieces missing
1. Tools
 1. *Untitled Section*
 1. *Untitled Section*
 2. Summary
 1. *Untitled Section*
 2. CSS3
 3. *Untitled Section*
 4. SVG
 5. *Untitled Section*
 6. *Untitled Section*
 7. Other Useful Sites
 8. *Untitled Section*
 9. *Untitled Section*

Features – New Elements

- `<audio>` and `<video>` elements
 - **Not quite ready for prime time**
 - Require codecs to display properly
 - Different browsers use different codecs
 - Therefore, we need to think in terms of graceful degradation
 - <http://learning-html5.info/examples/ExampleAudio1.html>
`<audio controls="controls">`
`<source src="peking-moon.ogg" type="audio/ogg" />`
`<source src="peking-moon.mp3" type="audio/mpeg" />`
`Download the MP3 version`
`</audio>`

Results

<audio> and <video> in Chrome

Example audio file (yes, it is a stolen parody)



Song lyrics - "Did you ever think when you eat..."



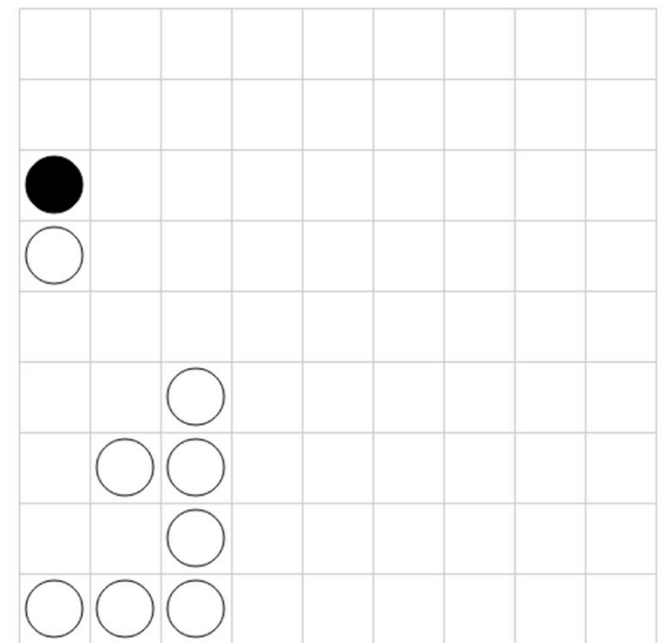
Features – New Elements

- <canvas> element
 - Good opportunity to speak about DOM and JavaScript
 - Halma example from “Dive into HTML5”

Canvas Halma

[\(Rules of play\)](#)

Moves: 6



- If you want to work with the <canvas> element in IE8 or earlier, consider using excanvas.js
- <http://excanvas.sourceforge.net/>

Features – New Elements

- `<canvas>` element
 - Online image converter (yes, image on left is SVG as well as image on right)

Examples of SVG images



- Although you can draw SVG directly...
`<circle cx="50" cy="50" r="30"`
`style="stroke:none; fill:#ff0000;"/>`
- ... to display in most current browsers, need to use JavaScript

My favorite new element



`<mark>`

Denotes “a run of text in one document marked or highlighted for reference purposes...”

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- Web sockets
- Offline web applications
- Microdata

Features - Forms

- Smart phones incorporate a number of these features
 - For example, if you select a given input field on a smart phone, your keyboard may change (depending on the type of input field)
 - New input types include (input type = “ ”):
 - email
 - url
 - number, range (slider control – specify min, max, step, value)
 - tel
 - date, month, week, time, datetime, datetime-local
 - search
 - color (color picker)

Features - Forms

- Smart phones incorporate a number of these features
 - Additional attributes with input
 - placeholder – initial text displayed in form field
 - autofocus
 - required
 - autocomplete="off" – prevent pre-filling information
 - `<form ... autocomplete="off">` or
 - `<input ... autocomplete="off">`

Forms in various browsers

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Show me

Reset

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Show me

Reset

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Show me

Reset



Browser support for new form input types and attributes is mixed.

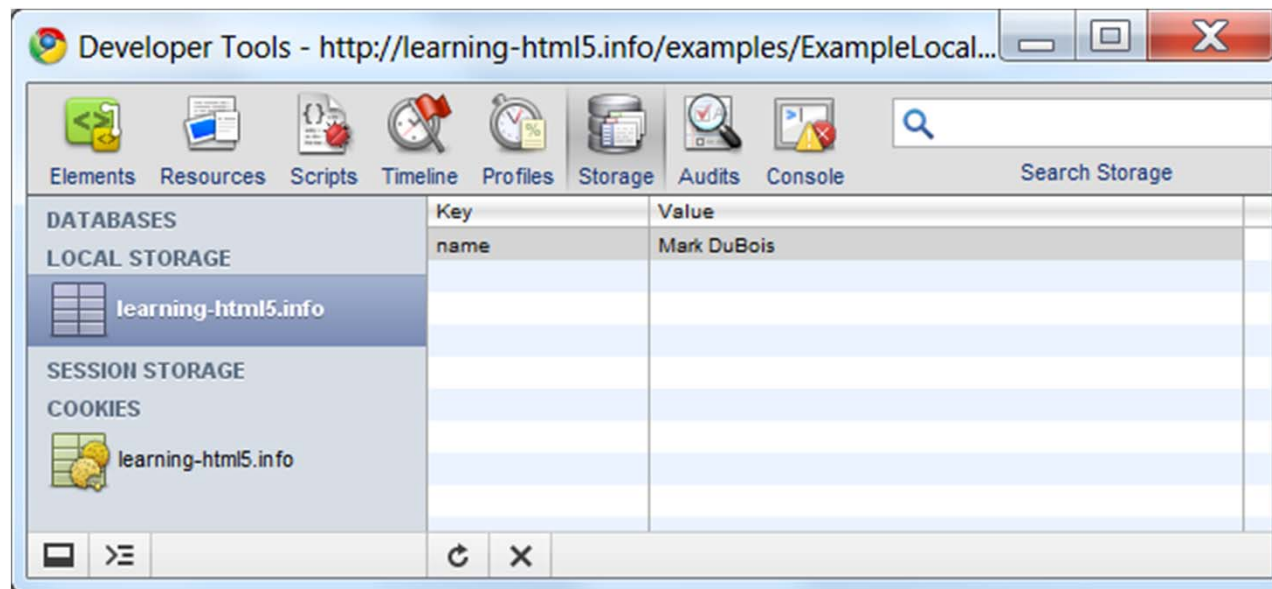
Most browsers treat these as type="text" so why not use these enhancements?

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- **Local storage**
- Web sockets
- Offline web applications
- Microdata

Features – Local Storage

- Cookies – 4096 bytes of information
- Local storage (from 5 – 10 MB per domain)
 - Malicious individuals will exploit
 - Stored in key=value pairs (like cookies)
- <http://learning-html5.info/examples/ExampleLocalStorage1.html>



Features – Local Storage (2)

```
function addName() {
```

```
...
```

```
    localStorage.setItem("name", nameData);
```

```
...
```

```
} // end function
```

```
function removeName() {
```

```
    localStorage.removeItem("name");
```

```
}
```

```
function showName() {
```

```
    var nameData = localStorage.getItem("name");
```

```
...
```

```
}
```

Features – Local Storage (3)

- Session storage is alternative

Session Storage	Local Storage
Persist only as long as window/ tab remains open	Persist beyond browser session
Only visible in window/ tab	Visible across all windows/ tabs from origin URL

- Some browsers do not support session storage at this time

Features – Local Storage (4)

- XSS exploit
 - <http://michael-coates.blogspot.com/2010/07/html5-local-storage-and-xss.html>
- Not recommended for session identifiers
- Not recommended for any sensitive data



Local storage will be much more than cookies.

Student should be aware but be careful of implementing (for now).

Students should understand possible attack vectors.

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- **Web sockets**
- Offline web applications
- Microdata

Features – Web sockets

- Web typically one directional (pre-AJAX)
 - Pages send requests to web servers
- With AJAX, simulate request from server to client known as polling
- Web sockets
 - When data changes on the server
 - Server sends request to client indicating data has changed
- For more information/ example:
 - <http://www.webkrunk.com/2010/04/30/html5-web-sockets-example/>



Interactions between client and server are changing (think AJAX and more).


Student should be aware but be careful of implementing (for now).

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- Web sockets
- **Offline web applications**
- Microdata

Features – Offline Web Apps

- If you visit an offline enabled website...
 - Web server tells the browser which files it needs to work offline
 - Files can be anything (images, HTML, JavaScript)
 - You can then visit the site (even when not connected to the Internet)
 - When you are back online, any changes you have made can be sent to the remote server



Concept of what it means to visit a web page is changing (don't have to be connected to Internet at that moment).

Student should be aware but be careful of implementing (for now).

Features

- Deprecated elements and attributes
- New elements (audio, video, canvas)
- Enhancements to forms (input types, placeholder text, autofocus)
- Local storage
- Web sockets
- Offline web applications
- **Microdata**

Features - Microdata

- Idea is to make web more useful to users
- Like microformats, but more
- **“Microdata annotates the DOM with scoped name/ value pairs from custom vocabularies”**
- Example on next two slides
- For more information:
- <http://diveintohtml5.org/extensibility.html>
- <http://briancray.com/2010/09/08/html5-microdata/>

Features – Microdata (2)

- Consider current posting

<div>

<h1>Fantastic event**</h1>**

<p>This is going to be fun. You won't want to miss.**</p>**

<p>When: Oct. 19th, 2010 at 6:00pm to Oct. 19th, 2010 at 8:00pm.**</p>**

<p>Where: Chicago Sears Tower**</p>**

</div>

Features – Microdata (2)

- Consider revised posting

```
<div itemscope itemtype="http://data-vocabulary.org/Event">
```

```
<h1 itemprop="summary">Fantastic event</h1>
```

```
<p itemprop="description">This is going to be fun. You won't  
want to miss.</p>
```

```
<p>When: <span itemprop="startDate" datetime="2010-10-  
19T18:00">Oct. 19th, 2010 at 6:00pm</span> to <span  
itemprop="endDate" datetime="2010-10-19T20:00">Oct. 19th,  
2022 at 8:00pm</span>.</p>
```

```
<p itemprop="location" itemscope itemtype="http://data-  
vocabulary.org/Organization">Where: <span  
itemprop="name">Chicago Sears Tower</span></p>  
</div>
```

Features – Microdata (3)

- <http://www.data-vocabulary.org/Event/>

Event

- Looking for Google's [webmaster docs](#)?
- Looking for [RDF](#)?

See our [Event webmaster docs](#) for full explanation of the Event type, and how to encode Event data in RDFa, microformats or microdata. This page exists to contain a machine-readable microdata description of the Event type itself (at the URI <http://data-vocabulary.org/Event>).

An item with the [item type](#) <http://data-vocabulary.org/Event> represents an event such as a concert, lecture, class, etc. The following are the type's [defined property names](#)

Property	Description
summary	Required. The name of the event.
url	Link to the event details page.
location	The location or venue of the event. Can optionally be represented by nested Organization data, or nested Address data. Recommended (unless the page containing the markup is a page about the venue, and the location is the same for every event.) More information about nested entities .
description	A description of the event.
startDate (dtstart)	Required. The starting date and time of the event in ISO date format .
endDate (dtend)	The ending date and time of the event in ISO date format .
duration	The duration date of the event in ISO duration format .
eventType (category)	The category of the event, such as "Festival", "Concert", "Lecture".
geo	Specifies the geographical coordinates of the location. Includes two elements: <code>latitude</code> and <code>longitude</code> . Optional.
photo	A link to a photo or image related to the event.



Microdata is an extension to HTML5
itemscope, itemtype, and itemprop
are new attributes

Microformats rely on classes (but
provided some of the foundation for
microdata)



Ok, I get it...

lots of new features, but...

Agenda

- Overview
- Features
- What can I use today
- Suggestions for incorporating
- Tools

Browser support varies widely

HTML 5, CSS3, and SVG

- [Weblog](#)
- [Examples](#)
- [Browser comparisons](#)
- [When can I use site](#)
- [CSS3.info site](#)
- [HTML 5 test site](#)

Note: top navigation links are for this site. Second set are other sites.

Copyright 2010.
Mark DuBois. All
rights reserved.

Overview

Fundamentals

I intend to document what I learn as I develop examples of HTML 5 for use in various classes. I also tend to include notes for CSS3 and SVG as time permits.

Insights

As I update these pages, I hope to share some insights as to what works and what doesn't in various browsers. As you may suspect, Internet Explorer 8 does not render these pages very well).

Mobile

I also hope to include a section on development for mobile devices (such as the Android) as I learn more about that topic.

Validation

Periodically, I run these pages through the experimental HTML 5 conformance checker at the W3C site. () is the URL. I also validate the CSS periodically. This means that at any given point in time these pages may not validate. If that is the case, just let me know and I will be glad to explain the current state of these pages.

HTML 5, CSS3, and SVG

Overview

Fundamentals

I intend to document what I learn as I develop examples of HTML 5 for use in various classes. I also tend to include notes for CSS3 and SVG as time permits.

Insights

As I update these pages, I hope to share some insights as to what works and what doesn't in various browsers. As you may suspect, Internet Explorer 8 does not render these pages very well).

Mobile

I also hope to include a section on development for mobile devices (such as the Android) as I learn more about that topic.

Validation

Periodically, I run these pages through the experimental HTML 5 conformance checker at the W3C site. (<http://validator.w3.org/>) is the URL. I also validate the CSS periodically. This means that at any given point in time these pages may not validate. If that is the case, just let me know and I will be glad to explain the current state of these pages.

Copyright 2010. Mark DuBois. All rights reserved.

[Weblog](#)

[Examples](#)

[Browser
comparisons](#)

[When can I use
site](#)

[CSS3.info site](#)

[HTML 5 test site](#)

Note: top
navigation links
are for this site.
Second set are
other sites.

Forms in various browsers

Most browsers will render as `<input type="text..."`

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Show me

Reset

Example form (no information is collected)

Contact details

- Name:
- eMail:
- Favorite website:
- Favorite number:
- Contact phone:

Show me

Reset



What else can I
use today?

Browsers and history

- `<!DOCTYPE...>` as an example
- Plethora of different flavors of HTML
- Decision that browsers would either go into:
 - **Quirks** mode – no `<!DOCTYPE ...>` specified (or whitespace before `<!DOCTYPE ...>` declaration)
 - **Standards** mode - `<!DOCTYPE ...>` specified
- A fair number of `<!DOCTYPEs ...>` exist
 - XHTML has strict, transitional, and frameset
- Knowing where we came from can help drive what we might consider teaching

Teach today – my suggestions

`<!doctype html>`

`<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">`

`<html lang="en">`

`<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">`

`<meta charset="UTF-8">`

`<meta http-equiv="Content-Type" content="application/xhtml+xml; charset=UTF-8">`

Styling

- Browser support varies
- Declare new structural elements should force a line break

```
article, footer, header, section ... {  
    display: block;  
}
```

- Of course, IE 8 (and before) won't recognize new elements unless an example is created first

```
document.createElement('article');
```

- Remy Sharp developed script to handle this (will cover in a moment under incorporating)

ARIA

- Accessible Rich Internet Applications
 - Use <nav> element correctly in the future
 - No longer a need for “skip navigation” links
- ARIA roles are part of HTML5 specification
 - role=“search” for a search form, for example
 - List of roles at http://www.w3.org/TR/wai-aria/roles#role_definitions
 - Above is fairly exhaustive list

Validation

- Many possibilities for discussions with students
 - W3C validator will validate HTML5
 - Separate validator at <http://validator.nu>

Validator.nu 3

Validator Input

Address

Encoding

Schemas

Preset

Parser

XMLNS Filter

☐ Be lax about HTTP Content-Type

☐ Show Image Report

☐ Show Source

Agenda

- Overview
- Features
- What can I use today
- **Suggestions for incorporating**
- Tools

Incorporating

Have it your way

```
<div id="footer">  
<p>©2010 <a href="#">Mark DuBois</a></p>  
</div>
```

```
<footer>  
<p>©2010 <a href="#">Mark DuBois</a></p>  
</footer>
```

Incorporating - tools

- IE – problem child
 - Must first create element with JavaScript
`document.createElement('nav');`
 - Remy Sharp developed code to generate new HTML5 elements
 - Use conditional comment to include his code (if you want something to be styled in IE)
- IE 9 (beta underway)

Incorporating – tools (2)

- IE – problem child

```
<!-- [if lt IE 9]>  
  <script  
src="http://html5shiv.googlecode.com/svn/trunk/html5.js">  
  </script>  
<!--[endif] -->
```

- Example page –
<http://learning-html5.info/examples/ExampleIE1.html>
- Contrast in IE 8 with –
<http://learning-html5.info/examples/ExampleForm1.html>

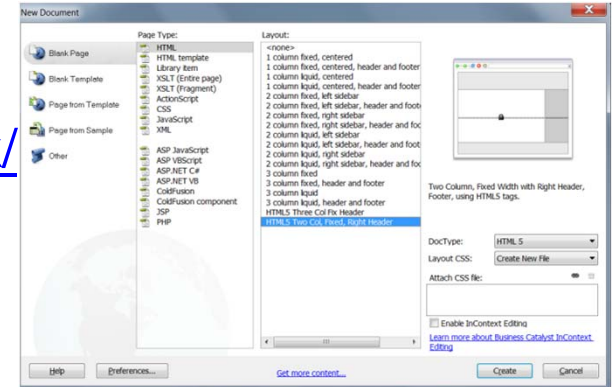
Agenda

- Overview
- Features
- What can I use today
- Suggestions for incorporating
- Tools

Tools - Adobe

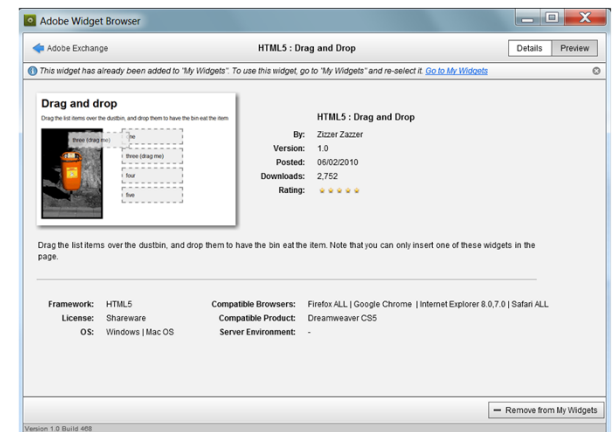
- Dreamweaver CS5 HTML5 Pack

- <http://labs.adobe.com/technologies/html5pack/>
- Example – <http://learning-html5.info>



- Widget browser - HTML5 drag and drop

- http://www.adobe.com/cfusion/exchange/index.cfm?event=extensionDetail&loc=en_us&extid=2162022
- Example – <http://learning-html5.info/examples/WidgetExample.html>

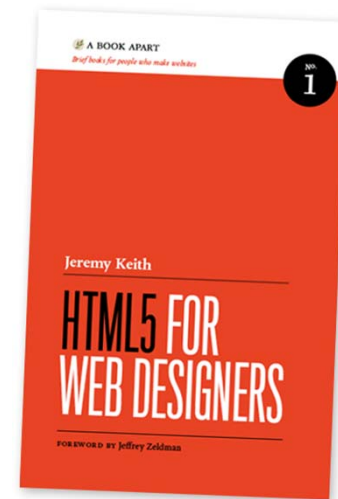


Other Tools

- Modernizr - <http://www.modernizr.com/>
 - Feature detection (determines what HTML5 and CSS3 is supported in the current browser)
 - Adds support for styling and printing HTML elements
 - Yes, this will work with IE
 - “Just include the modernizr-1.5.min.js JavaScript file in your page and add a class of "no-js" to your <html> element”
 - Global JS object
 - Query on a feature – if browser supports returns true, else returns false

References

- HTML5 for Web Designers – Jeremey Keith
- HTML5 Up and Running – Mark Pilgrim
- Lynda.com (HTML5 First Look – James Williamson)



Questions?

Mark DuBois
mdubois@icc.edu

@Mark_DuBois

