HTML5 for Publishers

An Introduction

Nellie McKesson | Digital Development Manager, O'Reilly Media, Inc. | Delhi, India, 30/11/2013

HTML5 for Publishers

by Sanders Kleinfeld
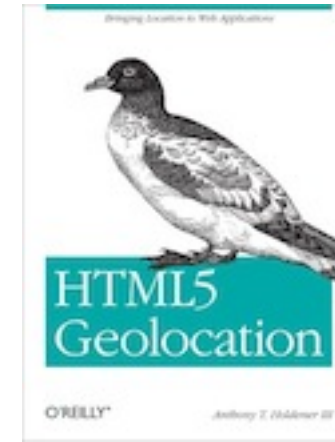
FREE

http://oreil.ly/qr38Cc
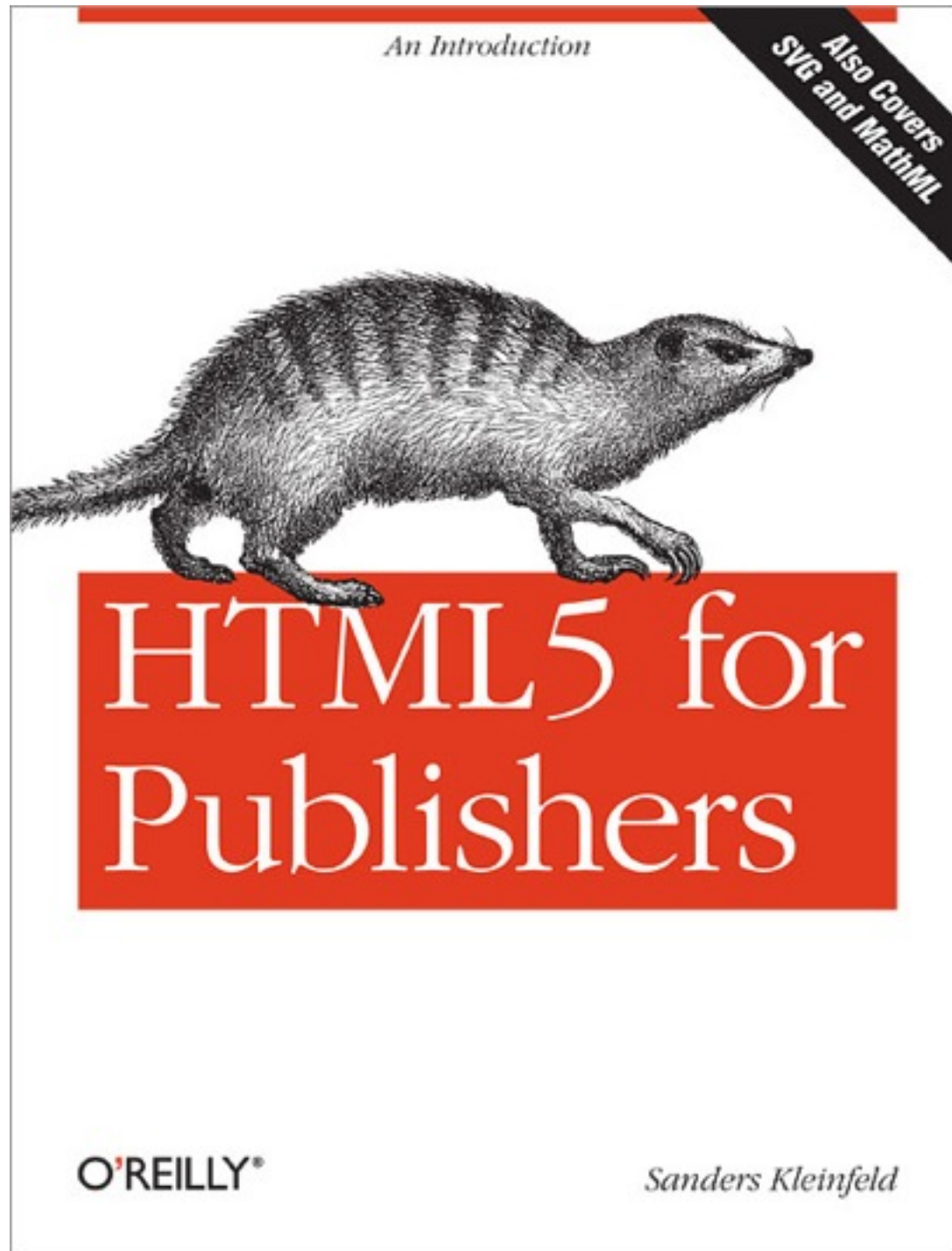
HTML is the backbone of
reflowable ebooks

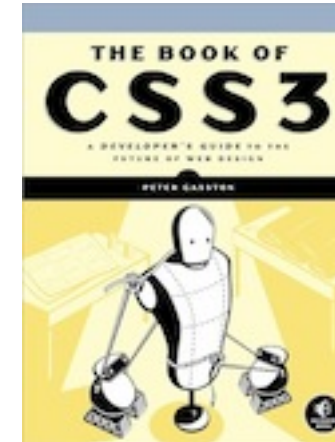# HTML 5 is a constellation
# of technologies


Canvas

Geolocation

Audio/Video

CSS 3

When people say "HTML5," they're usually referring to...

...next-generation websites that include one or more of the following:

- Embedded **audio/video** media without resorting to Flash or other plugins

- Native **interactivity/animation/games** without resorting to Flash or other plugins

- **Geolocation** functionality

- Sites with **local storage** that you can download and run offline

- Fancy **CSS3**: columns, text shadows, animations...

- Native support for **MathML** and **SVG**

- Proper **semantic markup**

HTML5 in action in ebooks:
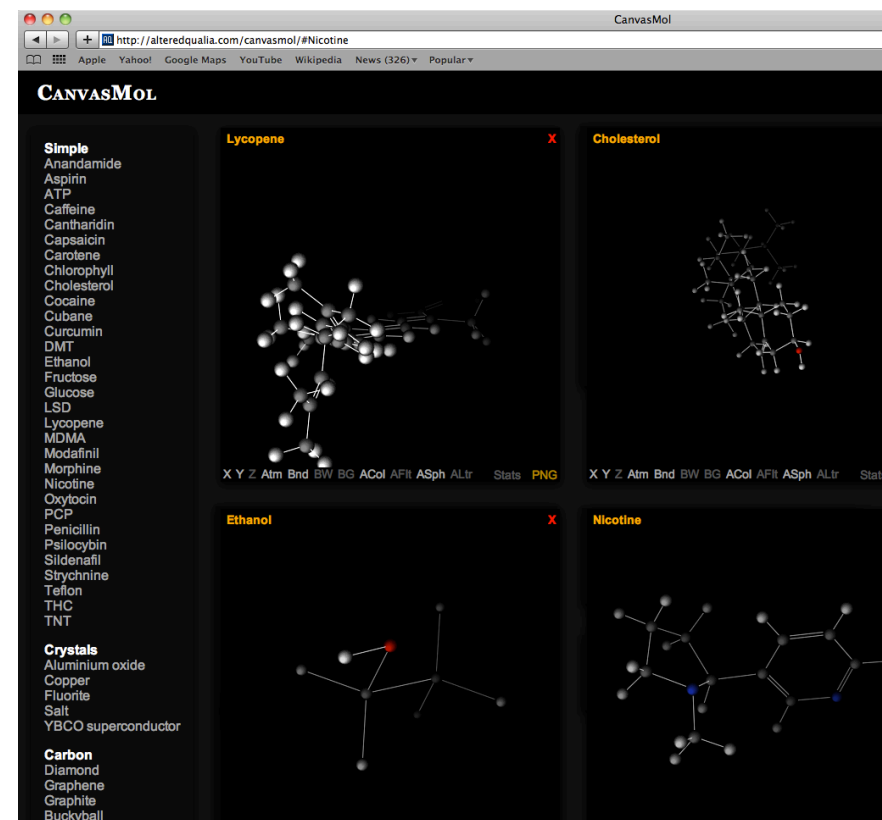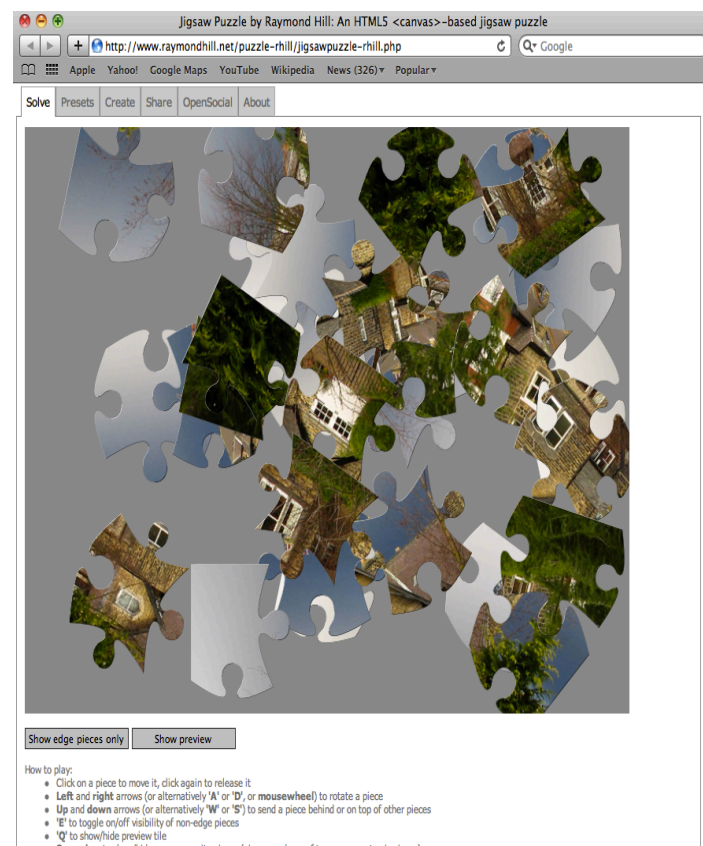
Why should publishers
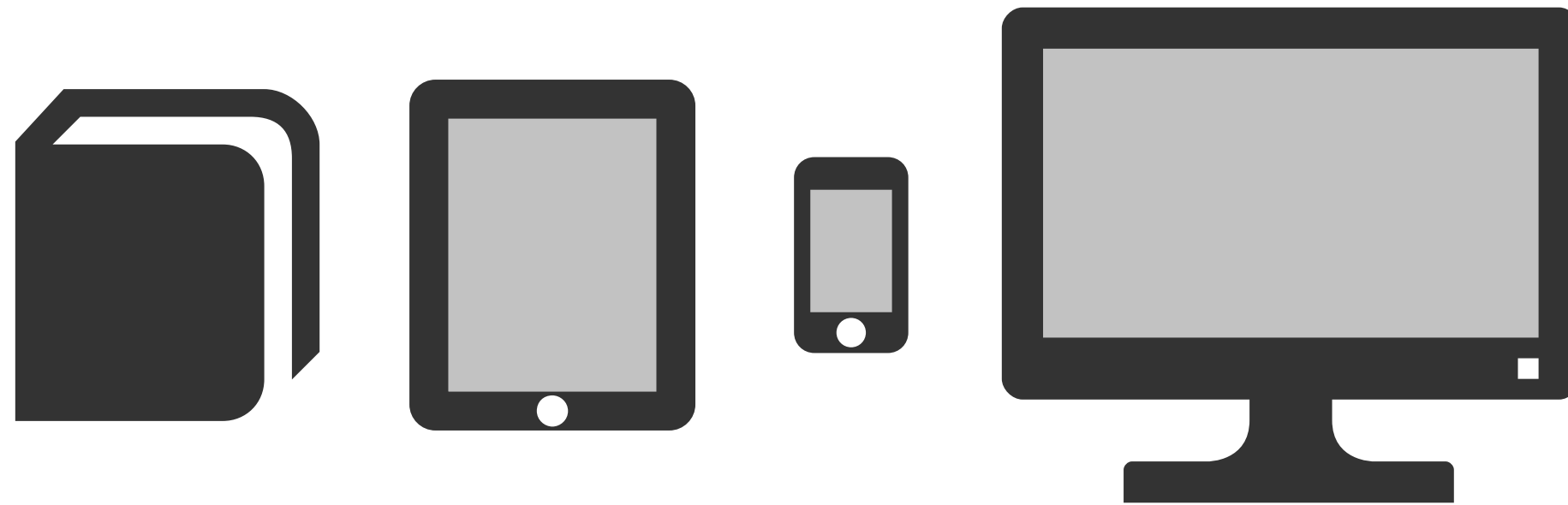# care about HTML5?

HTML5 is the backbone of EPUB3

While most major eReaders do not formally
support EPUB 3, many HTML5 features are
currently supported by the following platforms:

- iBooks for iOS (iPad, iPhone, iPod)

- Nook Color/Tablet

- Kindle Fire

- Kindle Apps (iPhone/iPad/Android, etc.)

- Safari Books Online

HTML + CSS 3 =
All book formats from HTML

HTML5 Canvas

Canvas example:
Draw a picture

```html
<canvas id="my_first_canvas" width="200"
height="225">
The content you put here will show up if
your rendering engine doesn't support the
&lt;canvas&gt; element.
</canvas>
```

You draw on the <canvas> with JavaScript

```
my_canvas.strokeRect(0,0,200,225) // to start, draw a border around the canvas

//draw face
my_canvas.beginPath();
my_canvas.arc(100, 100, 75, (Math.PI/180)*0, (Math.PI/180)*360, false); // circle dimensions
my_canvas.strokeStyle = "black"; // circle outline is black
my_canvas.lineWidth = 3; // outline is three pixels wide
my_canvas.fillStyle = "yellow"; // fill circle with yellow
my_canvas.stroke(); // draw circle
my_canvas.fill(); // fill in circle
my_canvas.closePath();

// now, draw left eye
my_canvas.fillStyle = "black"; // switch to black for the fill
my_canvas.beginPath();
my_canvas.arc(65, 70, 10, (Math.PI/180)*0, (Math.PI/180)*360, false); // circle dimensions
my_canvas.stroke(); // draw circle
my_canvas.fill(); // fill in circle
my_canvas.closePath();

// now, draw right eye
my_canvas.beginPath();
my_canvas.arc(135, 70, 10, (Math.PI/180)*0, (Math.PI/180)*360, false); // circle dimensions
my_canvas.stroke(); // draw circle
my_canvas.fill(); // fill in circle
my_canvas.closePath();

// draw smile
my_canvas.lineWidth = 6; // switch to six pixels wide for outline
my_canvas.beginPath();
my_canvas.arc(99, 120, 35, (Math.PI/180)*0, (Math.PI/180)*-180, false); // semicircle dimensions
my_canvas.stroke();
my_canvas.closePath();

// Smiley Speaks!
my_canvas.fillStyle = "black"; // switch to black for text fill
my_canvas.font        = '20px _sans'; // use 20 pixel sans serif font
my_canvas.fillText  ("Hello Canvas!", 45, 200); // write text
```
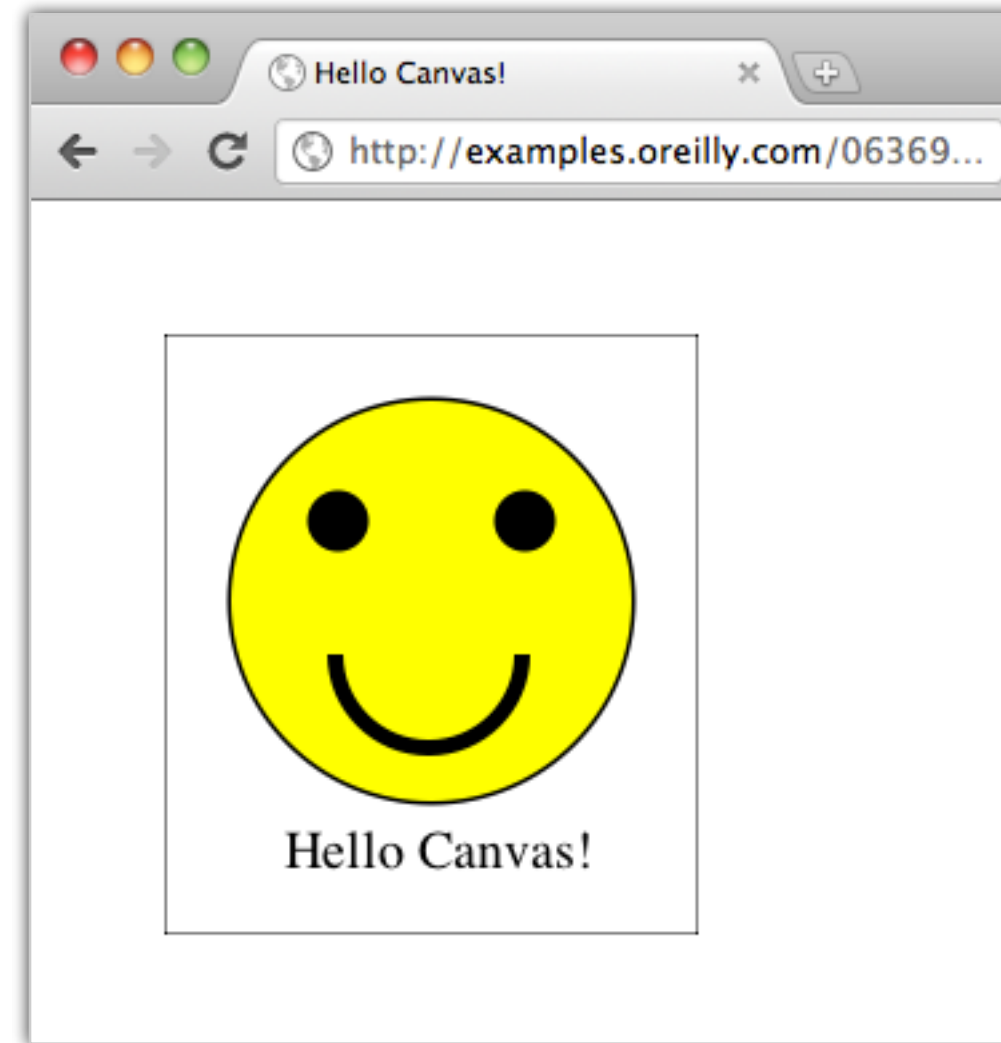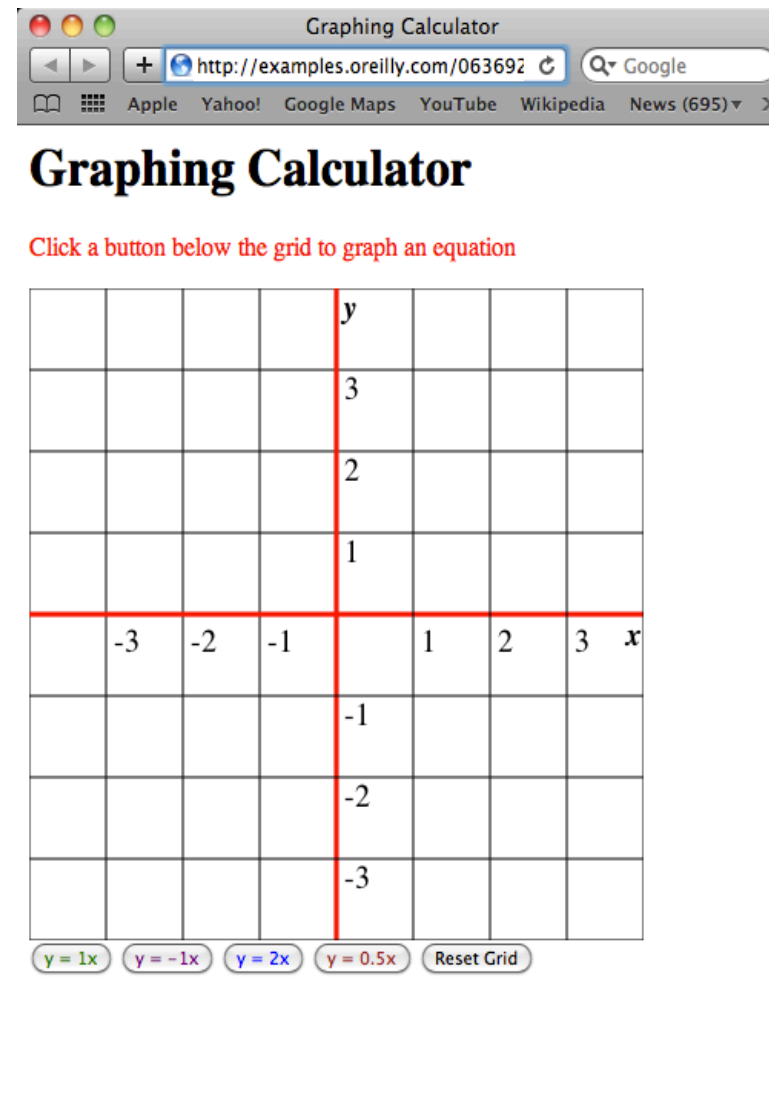
The Result:

But canvas is all about interactivity...

You can dynamically update what's displayed on the canvas in real time, and in response to user input, which opens the door to animations, games, and more.
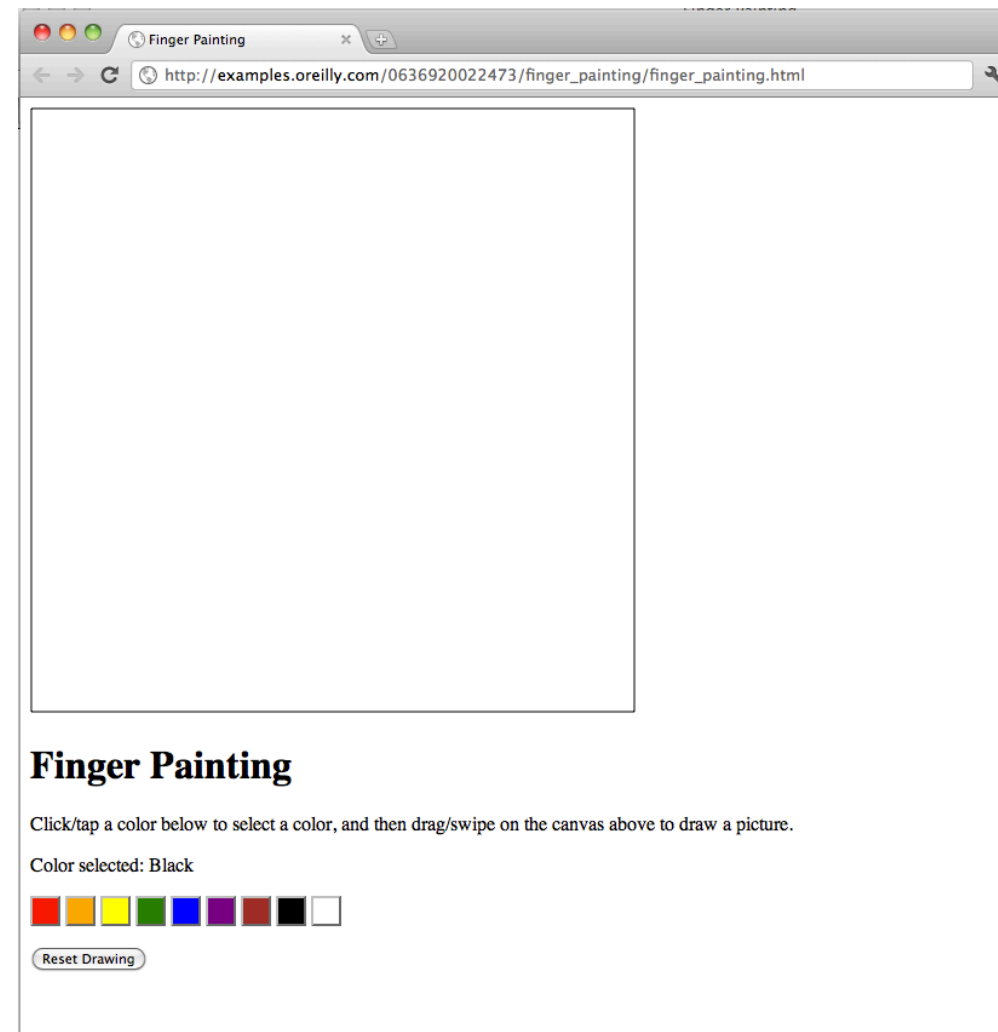
Canvas in Action 1:
Graphing Calculator
http://bit.ly/canvascalc

Canvas in Action 2:
Finger Painting
http://bit.ly/canvasfingerpaint

Geolocation

W3C Geolocation API

http://dev.w3.org/geo/api/spec-source.html

Get a user's latitude/longitude coordinates:

`navigator.geolocation.getCurrentPosition(`*`callback_function`*`)`

`callback_function`: a function you define to receive and process the latitude/longitude data.
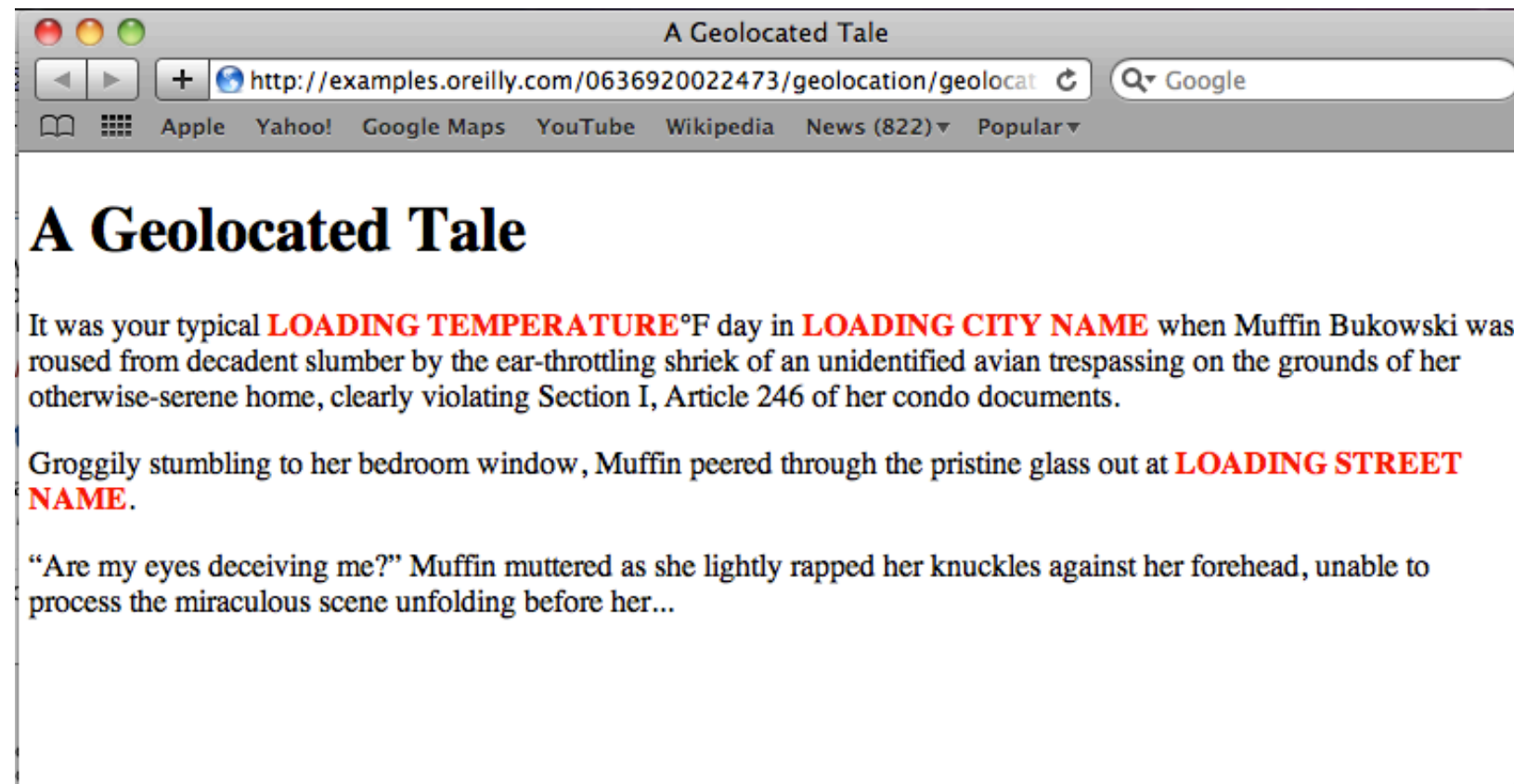
Geolocation's value in ebooks

- Interactive atlas, road maps
- Travel/Restaurant guides customized for user's location
- Geolocated fiction
- Geolocation-based games (geocaching, scavenger hunt)

Geolocation in Action:
A Geolocated Tale
http://bit.ly/geolocatedtale

Before:

Geolocation in Action:
A Geolocated Tale
http://bit.ly/geolocatedtale

After:

Audio/Video

Embed audio/video directly in your content
No plugins necessary

```
<audio id="new_slang">
<source src="new_slang.wav" type="audio/wav"/>
<source src="new_slang.mp3" type="audio/mp3"/>
<source src="new_slang.ogg" type="audio/ogg"/>
<em>(Sorry, &lt;audio&gt; element not supported in your browser/
ereader, so you will not be able to listen to this song.)</em>
</audio>

<video id="dancing_pony" width="300" height="300">
<source src="dancing_pony.mp4" type="video/mp4"/>
<source src="dancing_pony.ogg" type="video/ogg"/>
<em>(Sorry, &lt;video&gt; element not supported in your browser/
ereader, so you will not be able to watch this video.)</em>
</video>
```

Compatibility

<audio> support in Browsers
(http://en.wikipedia.org/wiki/Html5_audio#Audio_format_support)

Browser	Operating system	Formats supported by different web browsers					
		Ogg Vorbis	WAV PCM	MP3	AAC	WebM Vorbis	Ogg Opus
Google Chrome	All supported	9	Yes	Yes	Yes	Yes	25
Internet Explorer	Windows	No	No	9	9	No	No
Mozilla Firefox	All supported	3.5	3.5	Windows (21.0) and Linux (24.0) only	Windows (21.0) and Linux (24.0) only	4.0	15.0
Opera	All supported	10.50	11.00	14	14	10.60	14
Safari	OS X	Yes	3.1	3.1	3.1	No	No

<video> support in Browsers
(http://en.wikipedia.org/wiki/HTML5_video#Table)

Browser	Operating system	Latest stable release	Video formats supported			
			Theora	H.264	VP8 (WebM)	VP9 (WebM)
Android browser	Android	4.2.1 "Jelly Bean" (November 27, 2012; 11 months ago) [±][36][37]	2.3[38]	3.0[38]	2.3[38]	No
Chromium	All supported	N/A	r18297[39]	Manual install[note 1]	r47759[41]	r172738[42]
Google Chrome	31.0.1650.57 (November 14, 2013; 11 days ago) [±][43]		3.0[44][45]	3.0[45][note 2]	6.0[47][48]	29.0[note 3]
Internet Explorer	Windows	v11.0.9600.16438 (11.0.1) (12 November 2013; 13 days ago) [±]	Manual install[note 4]	9.0[52]	Manual install[note 5]	No
	Windows Phone	10.0 (November 21, 2012; 11 months ago) [±]	No	9.0[citation needed]	No	
	Windows RT	10.0		10.0[citation needed]		
Konqueror	All supported	4.11.3 (5 November 2013; 20 days ago) [±][55]	4.4[note 6]			
Mozilla Firefox	Windows 7+	25.0.1 (November 15, 2013; 10 days ago[57]) [±] ESR 24.1.1 (November 15, 2013; 10 days ago[58]) [±] ESR 17.0.11 (November 15, 2013; 10 days ago[59]) [±]	3.5[60]	21.0[note 7]	4.0[63][64]	No
	Windows Vista			22.0[65]		
	Linux			24.0[note 8]		
	Android			17.0[68]		
	All other supported			No		
Opera	All supported	**Blink** 18.0.1284.49 (November 19, 2013; 6 days ago[69]) [±] **Presto** 12.16 (July 4, 2013; 4 months ago[70]) [±]	10.50[71]	No	10.60[72][73]	
Safari	iOS	7.0 (October 24, 2013; 32 days ago) [±]	No	3.1[74][75]	No	
	MacOS X		Manual install[note 9]		Manual install[76]	

Ereader Audio/Video Compatibility

Audio: Use MP3
It works on:

- iBooks
- NOOK Color/Tablet
- Kindle software readers (iPad/iPhone/Android/etc.)
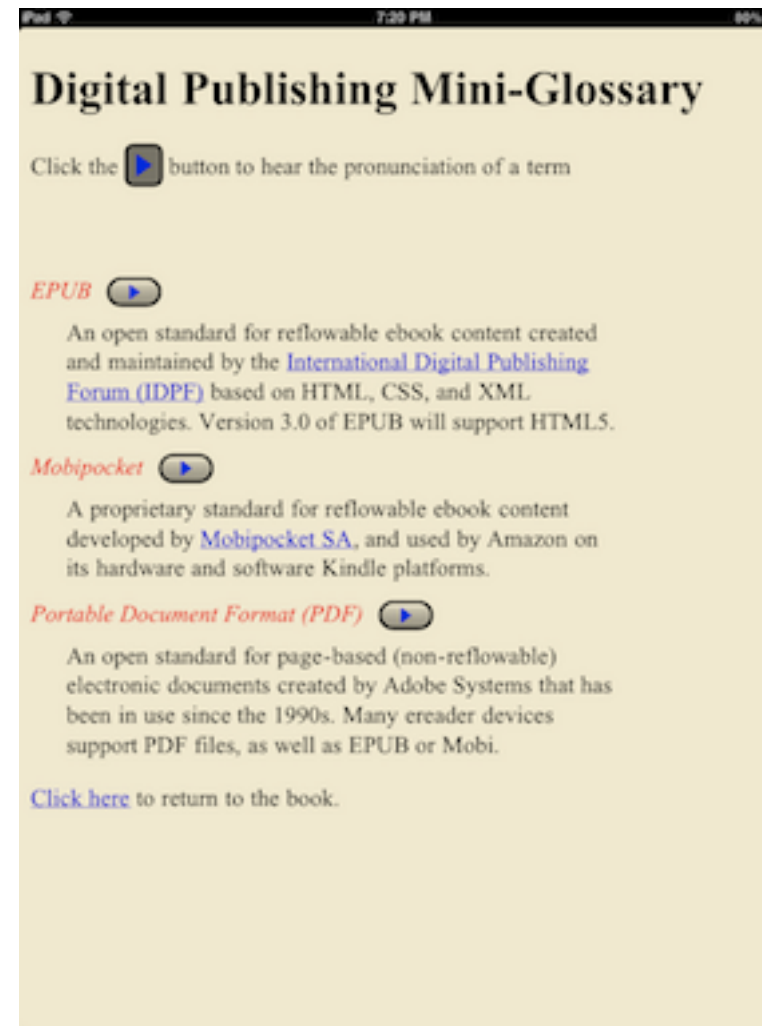
Video: Use H.264/MP4
It works on:

- iBooks
- NOOK Color/Tablet
- Kindle software readers (iPad/iPhone/Android/etc.)
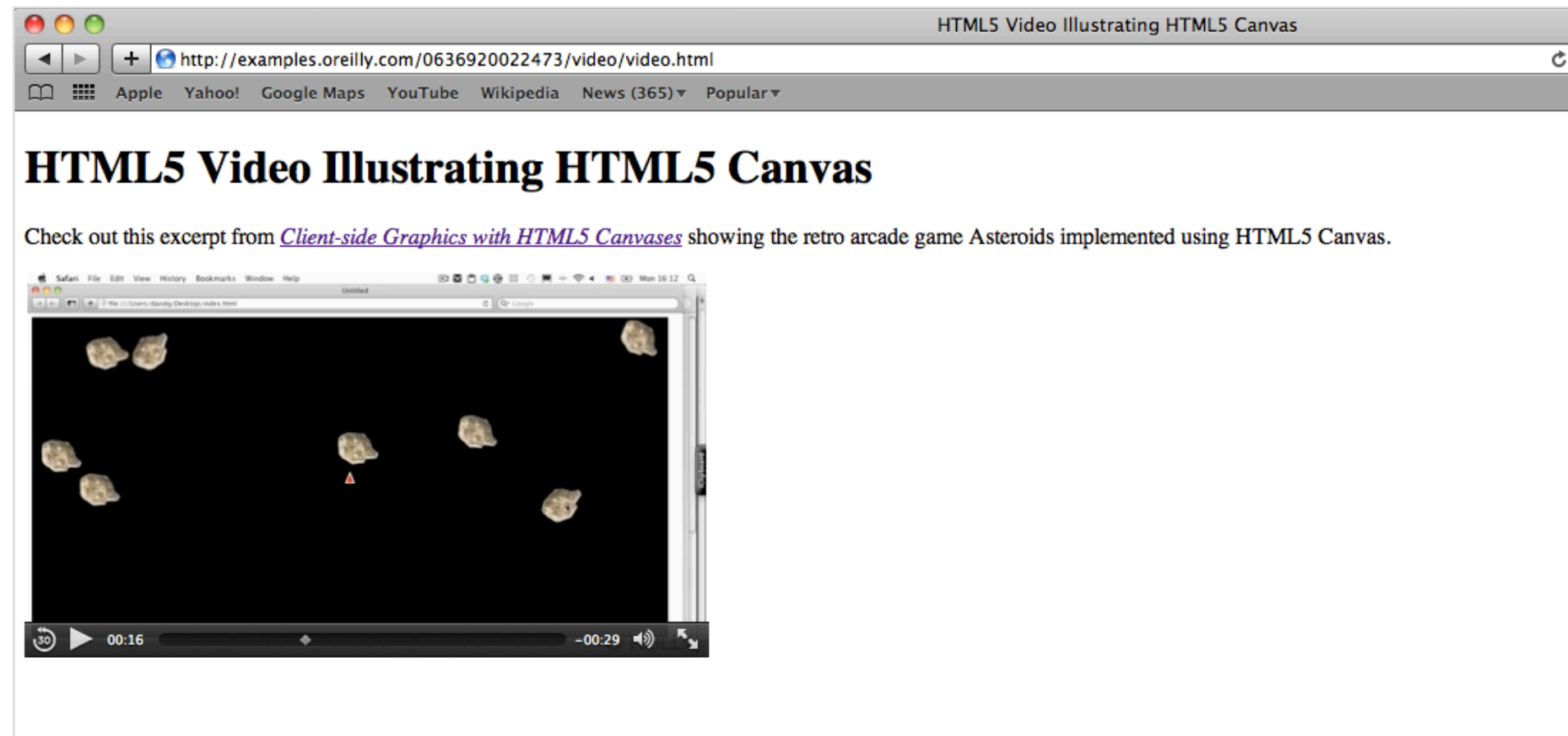
Audio in Action:
Audible Glossary
http://bit.ly/miniglossary

Video in Action:
A clip about <canvas>
http://bit.ly/ormcanvasvid

MathML

An XML vocabulary for mathematical expressions

- The HTML5 specification provides native support for MathML in HTML documents

- MathML provides both Presentation and Content Markup models.

Presentation markup tags math expressions based on how they should be displayed (for example, "superscripted 2").

<math> – Root element for a mathematical expression
<mrow> – Element for grouping subexpressions
<mo> – Math operator (e.g., +, -)
<mi> – Math identifier (e.g., variable or constant)
<mn> – Number
<mfrac> – Fraction
<msqrt> – Square root
<msup> – Superscript
<msub> – Subscript
<mfenced> – Parentheses or braces

Content markup tags expressions based on the mathematical operations performed (e.g., "taken to the 2nd power")
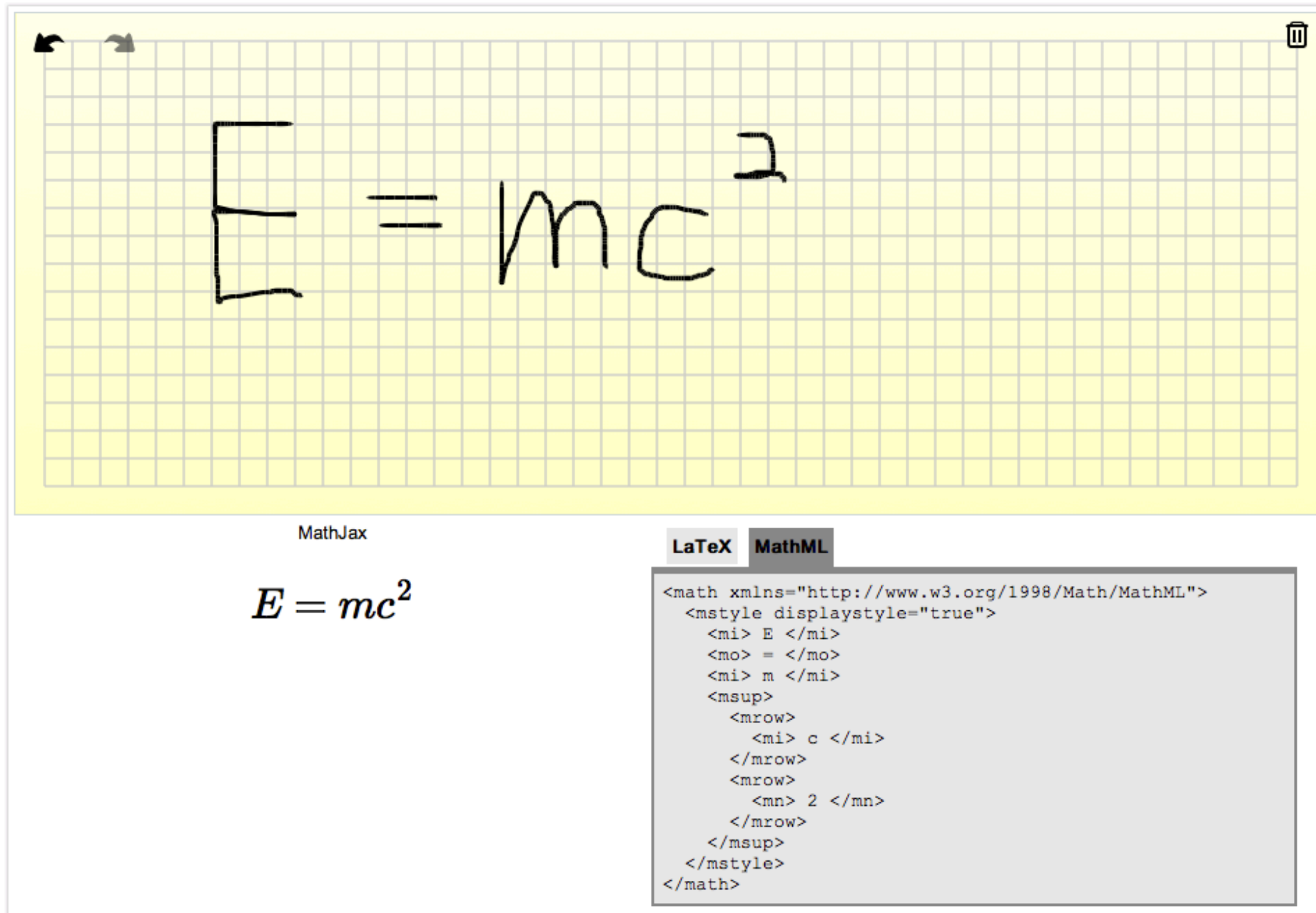
$$x + y + z$$

```
<apply>
  <plus/>
  <ci> x </ci>
  <ci> y </ci>
  <ci> z </ci>
</apply>
```

Convert a famous equation to MathML!
http://bit.ly/mathconverter

Why write all this markup:

```
<math xmlns="http://www.w3.org/1998/Math/MathML">
  <mstyle displaystyle="true">
    <mi> E </mi>
    <mo> = </mo>
    <mi> m </mi>
    <msup>
      <mrow>
        <mi> c </mi>
      </mrow>
      <mrow>
        <mn> 2 </mn>
      </mrow>
    </msup>
  </mstyle>
</math>
```

...when you can just embed the equation as an image?

Advantages of MathML over images

- Equations are resizable, like text

- Equations can be styled with CSS

- Equations can be interacted with using JavaScript

MathML in Action:
Quadratic Equation Solver
http://bit.ly/mathml

CSS 3

A Very Brief Overview

- New features: animations, rounded corners, text shadows, and transitions

- CSS 3 support is limited and varies by browser

- CSS 3 can also be used to make PDFs for print or Web

Fallbacks

What if your eReader Device
doesn't support CSS 3 or JavaScript?

When designing interactive content for a diverse eReader ecosystem, think about implementing fallbacks

<canvas>
<audio>
<video>
MathML
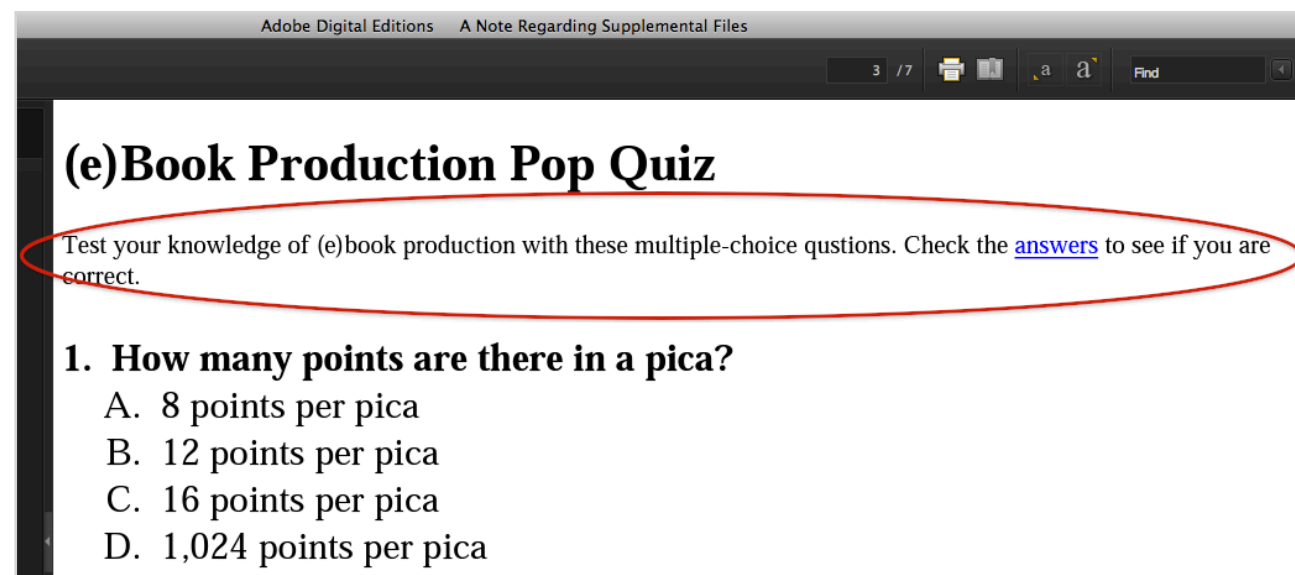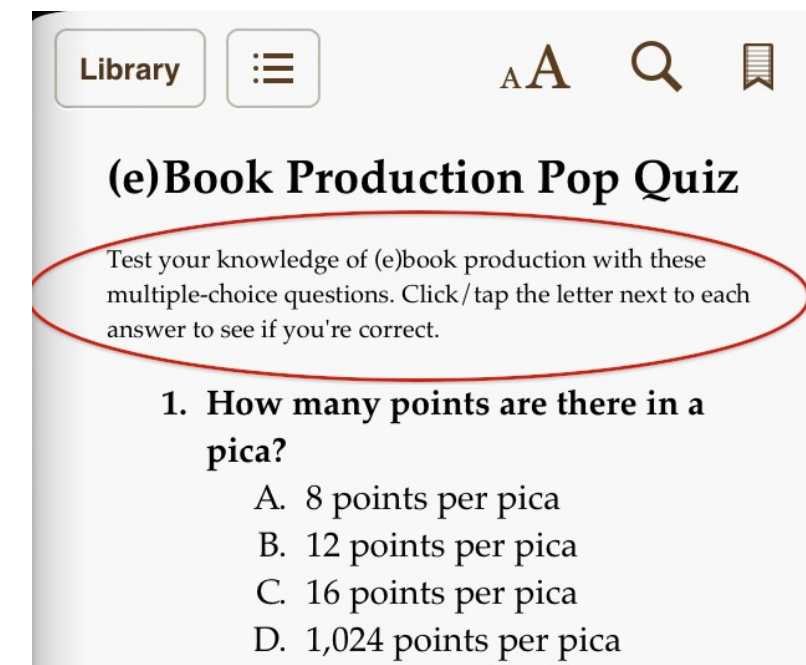Geolocation
CSS 3
JavaScript

Fallbacks example: CSS and JS
"Same ebook file, different instructions"

Adobe Digital Editions: No JS support

iBooks: Full functionality

Semantic Tagging

HTML5 Semantic Tagging:

New tags to mark up the sections of a document
more descriptively than you could in HTML 4.01

HTML 4.01:	HTML5:
<div>	<article>
	<aside>
	<div>
	<header>
	<footer>
	<figure>
	<figcaption>
	<nav>
	<section>

Semantic Tagging:
Before and After

HTML 4.01:

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>The United States Constitution</title>
</head>
<body>
<h1>THE UNITED STATES CONSTITUTION</h1>
<div class="section">
<h2>Preamble</h2>
<p>We the People of the United States, in Order to form
a more perfect Union...</p>
</div>
<div class="article">
<h2>Article I</h2>
<div class="section">
<h3>Section 1</h3>
<p>All legislative Powers herein granted shall be vested
in a Congress of the United States, which shall consist
of a Senate and House of Representatives.</p>
</div>
</div>
<div class="figure">
<img src="bald_eagle.jpg"/>
<div class="caption">The eagle has landed</div>
</div>
</body>
</html>
```

HTML5:

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>The United States Constitution</title>
</head>
<body>
<h1>THE UNITED STATES CONSTITUTION</h1>
<section>
<h2>Preamble</h2>
<p>We the People of the United States, in Order to form
a more perfect Union...</p>
</section>
<article>
<h2>Article I</h2>
<section>
<h3>Section 1</h3>
<p>All legislative Powers herein granted shall be vested
in a Congress of the United States, which shall consist
of a Senate and House of Representatives.</p>
</section>
</article>
<figure>
<img src="bald_eagle.jpg"/>
<figcaption>The eagle has landed</figcaption>
</figure>
</body>
</html>
```

Semantic Tagging:
Before and After

HTML 4.01:

HTML5:

So what's the point,
if the content looks the same?

Semantic tagging is for machines, not humans

It provides a universal grammar so that machines can more easily parse HTML content

It's Harder for a Machine
to parse this HTML...

`<p>`Web page created on January 18, 2012`</p>`

...than this HTML

`<footer>`
Web page created on
`<time pubdate="2012-01-18">`January 18, 2012`</time>`
`</footer>`

Extending HTML5 Semantics in EPUB 3

EPUB 3 supports "inflection" of HTML5 elements
through the epub:type attribute:

```
<section epub:type="colophon">
<p>The animal on the cover of this book is a meerkat…</p>
</section>
```

epub:type accepts the book terms defined in
the EPUB 3 Structural Semantics Vocabulary:

http://idpf.org/epub/vocab/structure/

These include: "volume", "chapter", "epigraph", "appendix", "glossary"…

HTML5 support in today's eReaders

	<canvas>	Geolocation	<audio>	<video>	MathML
iBooks 1.x	YES	Sort of *	YES	YES	YES
Nook Color/ Tablet	NO	NO	YES	YES	NO
Safari Books Online	YES	YES	YES	YES	YES
Kindle Apps	NO	NO	YES	YES	NO
Kindle Fire	NO	NO	NO	NO	NO

* iBooks 1.x supports Geolocation API, but does not support calls to related APIs (Google Maps, GeoNames, etc.)

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http://oreil.ly/qr38Cc