

# HTML5 Fundamentals

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## INTRODUCTION



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SENIOR WEB DEVELOPER

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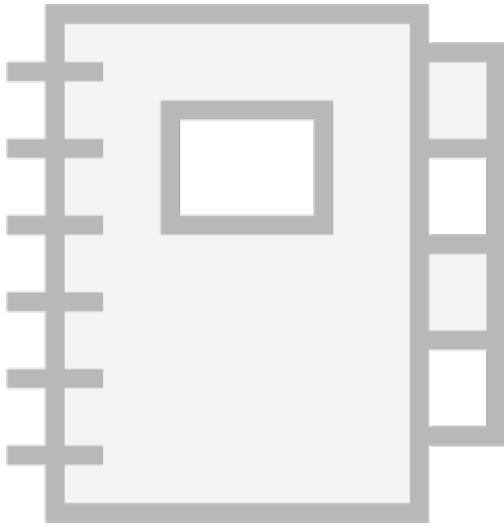
Demo



## Course Preview



# Course Overview



**Introduction**

**Finding Parts of the Page**

**Working with User Input**

**Music and Video (without Plugins)**

**Drawing Shapes, Charts and More**

**Creating Drag and Drop Interactivity**



# Prerequisites



Some HTML

Some JavaScript

Node.js Installed (optional)



“HTML5 is a markup language used for structuring and presenting content on the World Wide Web.”

- Wikipedia



```
<html>
  <body>
    <header>...</header>
    <main>...</main>
    <footer>...</footer>
  </body>
</html>
```



```
<html>
  <body>
    <div id="header">...</div>
    <div id="main">...</div>
    <div id="footer">...</div>
  </body>
</html>
```



```
<html>  
  <body>  
    <header>...</header>  
    <main>...</main>  
    <footer>...</footer>  
  </body>  
</html>
```







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# A (Very) Brief History of HTML5

Sources: [https://commons.wikimedia.org/wiki/File:Tim\\_Berners-Lee\\_April\\_2009.jpg](https://commons.wikimedia.org/wiki/File:Tim_Berners-Lee_April_2009.jpg), <http://code.tutsplus.com/articles/a-brief-history-of-html5--net-23064>



# A (Very) Brief History of HTML5



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HTML





Source: [https://commons.wikimedia.org/wiki/File:First\\_Web\\_Server.jpg](https://commons.wikimedia.org/wiki/File:First_Web_Server.jpg)





# A (Very) Brief History of HTML5



HTML

W3C  
World Wide  
Web Consortium



# A (Very) Brief History of HTML5



HTML

W3C  
World Wide  
Web Consortium

HTML 4



# A (Very) Brief History of HTML5



HTML

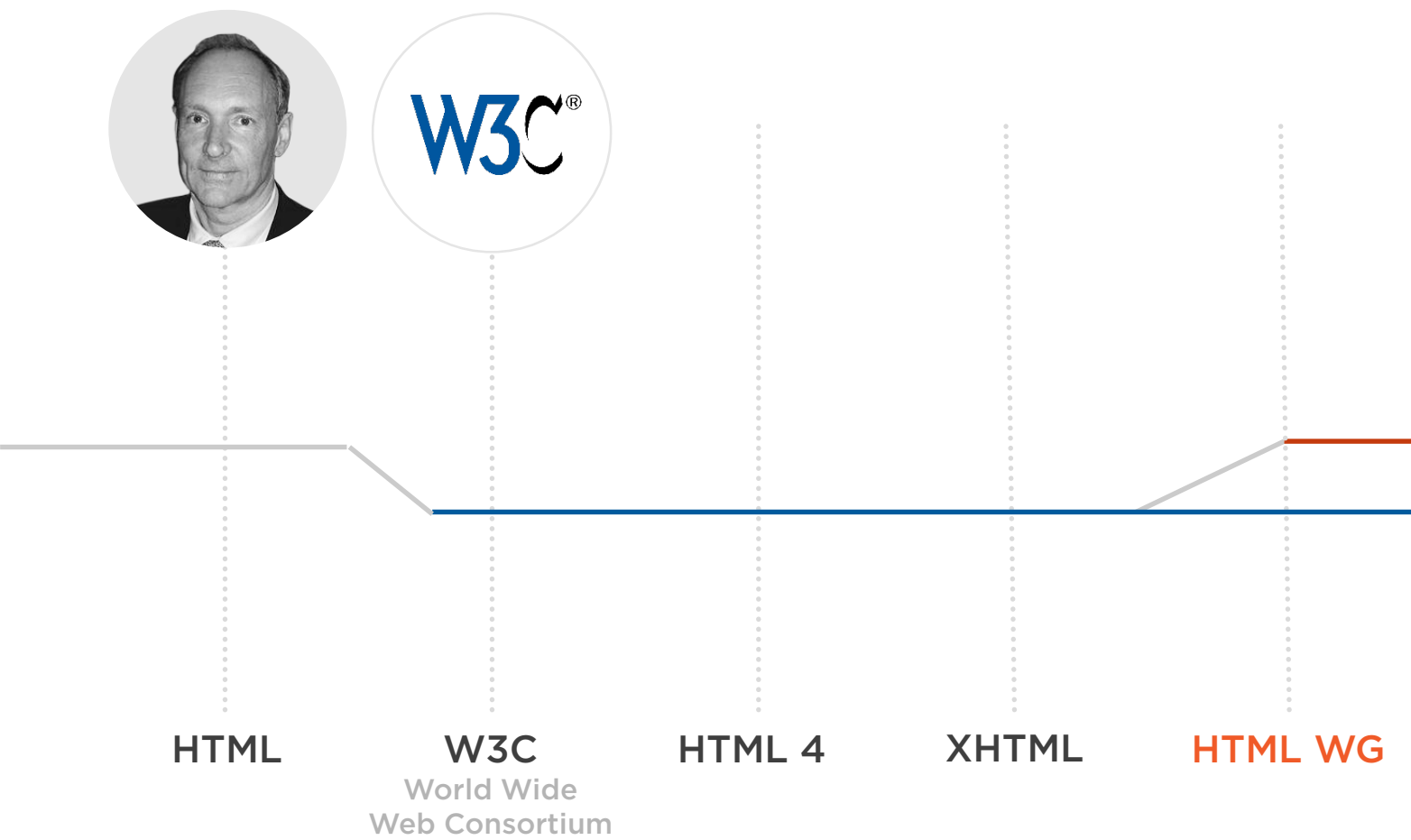
W3C  
World Wide  
Web Consortium

HTML 4

XHTML

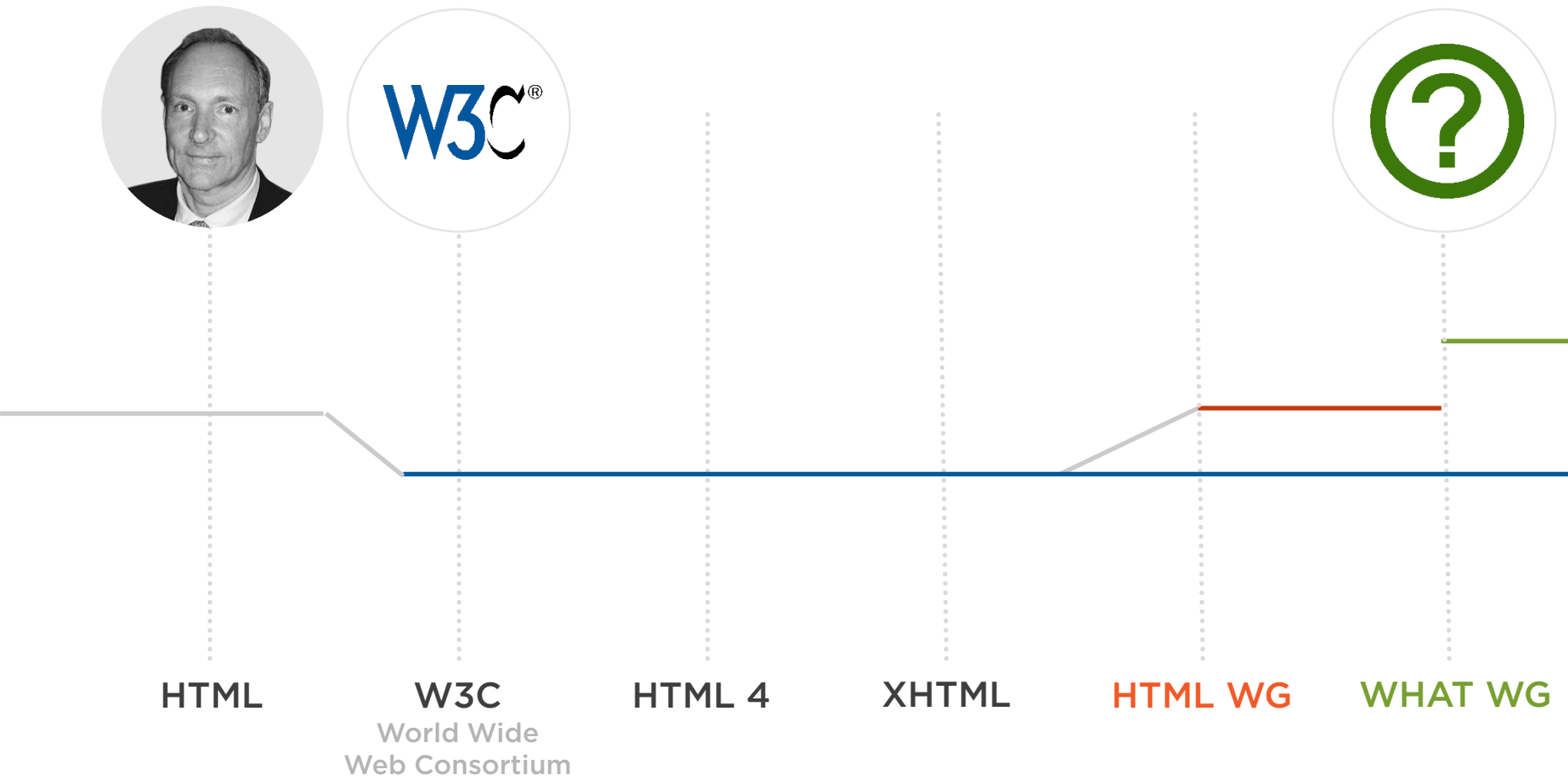


# A (Very) Brief History of HTML5

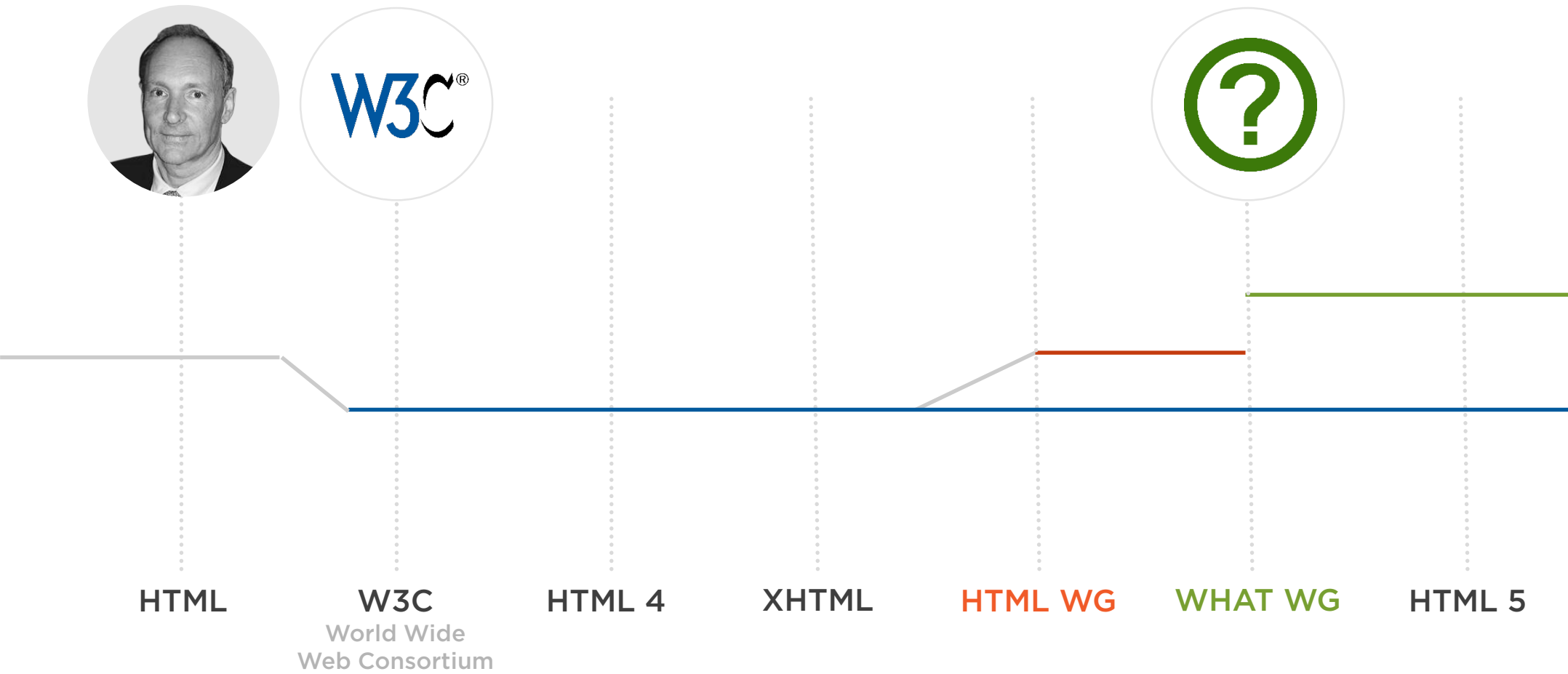




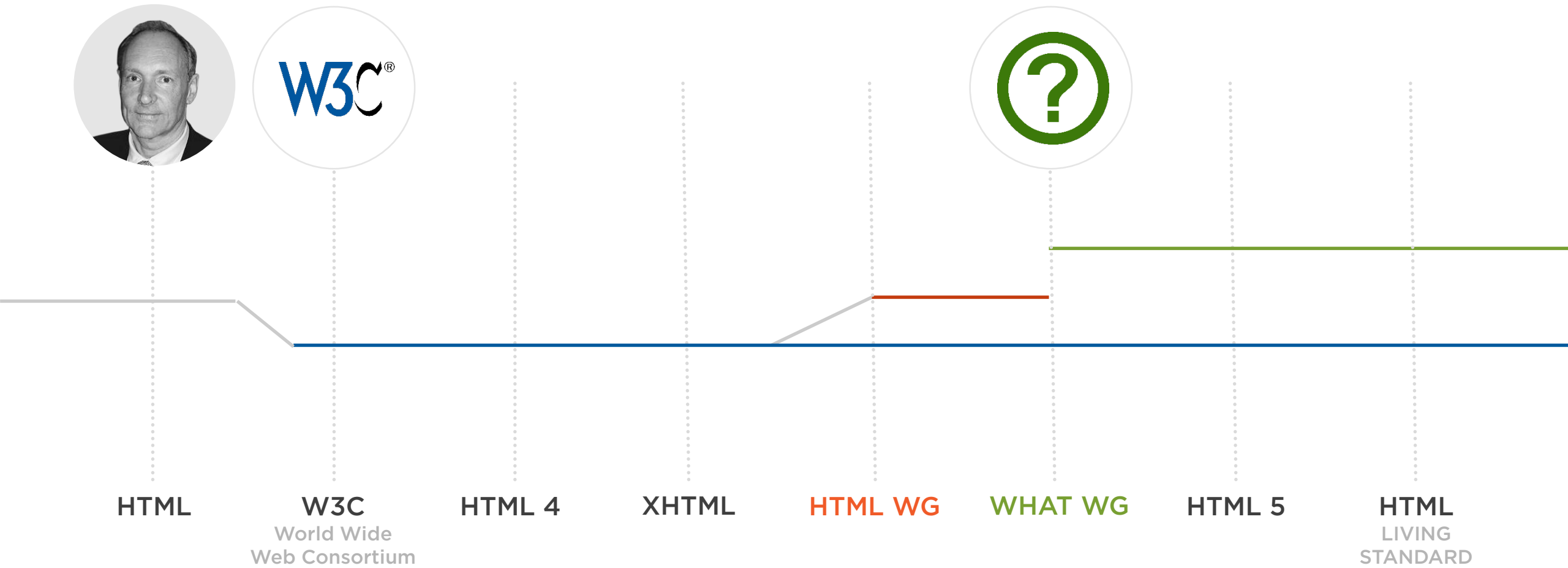
# A (Very) Brief History of HTML5



# A (Very) Brief History of HTML5



# A (Very) Brief History of HTML5



HTML5 no longer exists



# Demo



<https://platform.htm5.org/>



# Standards Bodies



W3C



WHATWG



ECMAScript



What, why and when



# What, why and when

What advances in the web platform are applicable to you?





# What, *why* and when

What sort of need are you trying to meet?



# What, why and when

At what point in time are the different technologies ready for widespread use?



What



# New HTML Elements

---



# New Elements

article  
aside  
audio  
bdi  
canvas  
datalist  
details  
embed  
figcaption  
figure  
footer

header  
main  
math  
mark  
meter  
nav  
output  
progress  
section  
source  
summary

svg  
time  
track  
video  
wbr





The diagram illustrates a web browser window. The window has a dark gray title bar with three small circles on the left. Inside the window is a large white rectangle representing the main content area. Within this area, there is a smaller white rectangle containing the text 'main'. Below the browser window, there is a white rectangular box containing the text 'CODE:' followed by the HTML code '<main></main>'. The code is color-coded: '<main>' is in red and '</main>' is in blue. A vertical orange line is positioned to the right of the code box.

main

CODE:

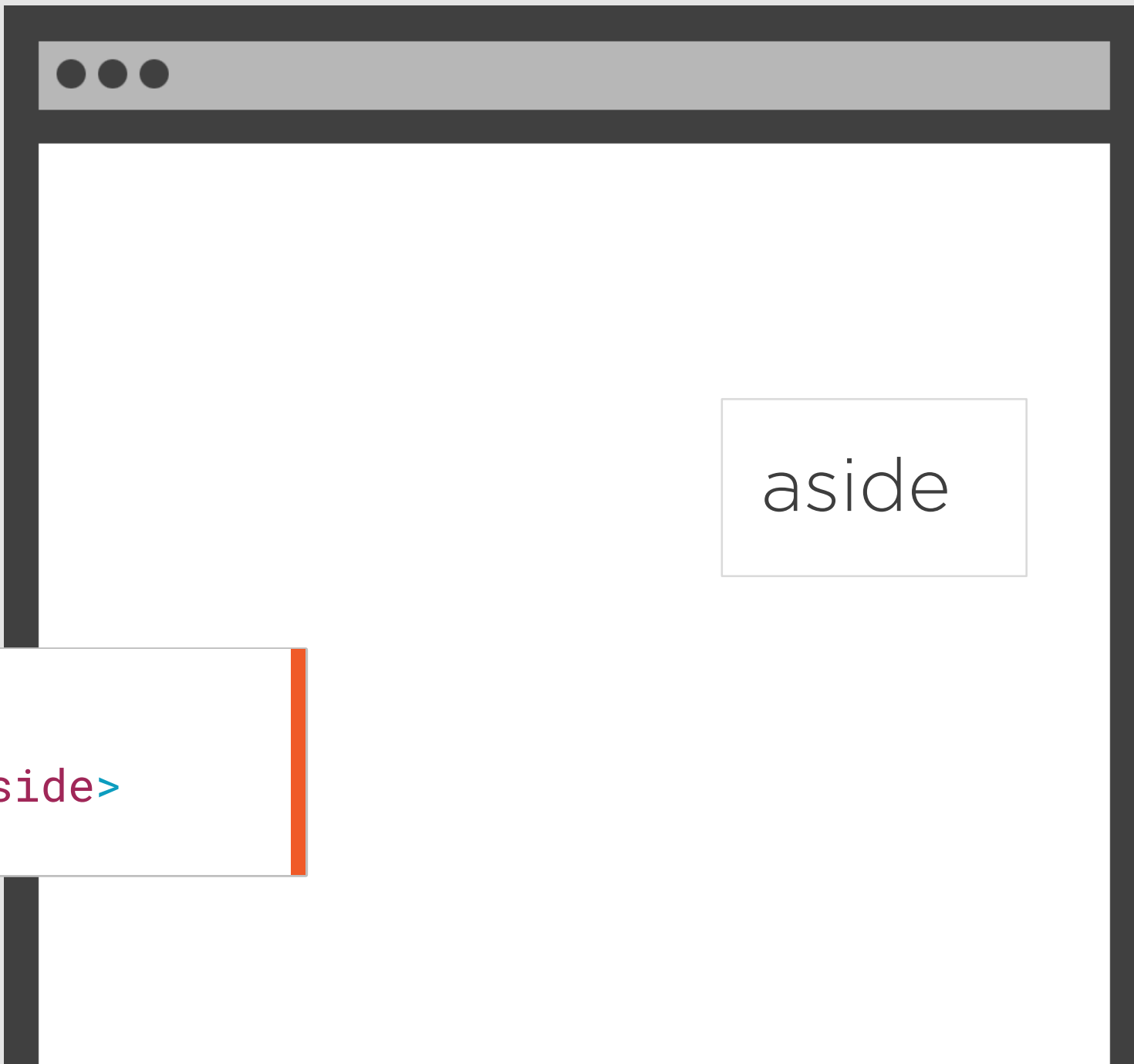
```
<main></main>
```



article

CODE:

```
<article></article>
```



CODE:

```
<aside></aside>
```





A diagram of a web browser window. The window has a dark gray title bar with three small circles on the left. The main content area is white. A light gray rectangular box is positioned in the center of the content area, containing the word "section". A white rectangular box is positioned in the bottom-left corner of the content area, containing the text "CODE:" and the HTML code "<section></section>". A vertical orange line is on the right side of this white box. The background of the entire image is light gray.

section

CODE:

```
<section></section>
```



header

**CODE:**

```
<header></header>  
<footer></footer>
```

footer



nav

CODE:

```
<nav></nav>
```

```
<html>
  <body>
    <header>
      <nav>...</nav>
    </header>
    <main>
      <article>
        <section>...</section>
        <aside>...</aside>
      </article>
    </main>
    <footer>
      <nav>...</nav>
    </footer>
  </body>
</html>
```



A diagram illustrating an XML element. At the top, a browser window frame is shown with three dots in the title bar. Inside the window, a light gray box contains the word "time". Below the window frame, a white box contains XML code. A vertical orange line connects the "time" box to the code block.

time

**CODE:**

```
<time  
  date="2016-08-12" pubdate>  
  August 12, 2016  
</time>
```

## CODE:

```
<figure>
  <figcaption>
    Screenshot of Menu
  </figcaption>
  
</figure>
```

figure  
figcaption

**CODE:**

```
<details>  
  <summary>Events</summary>  
  <p>Come join us.</p>  
</details>
```

details  
summary



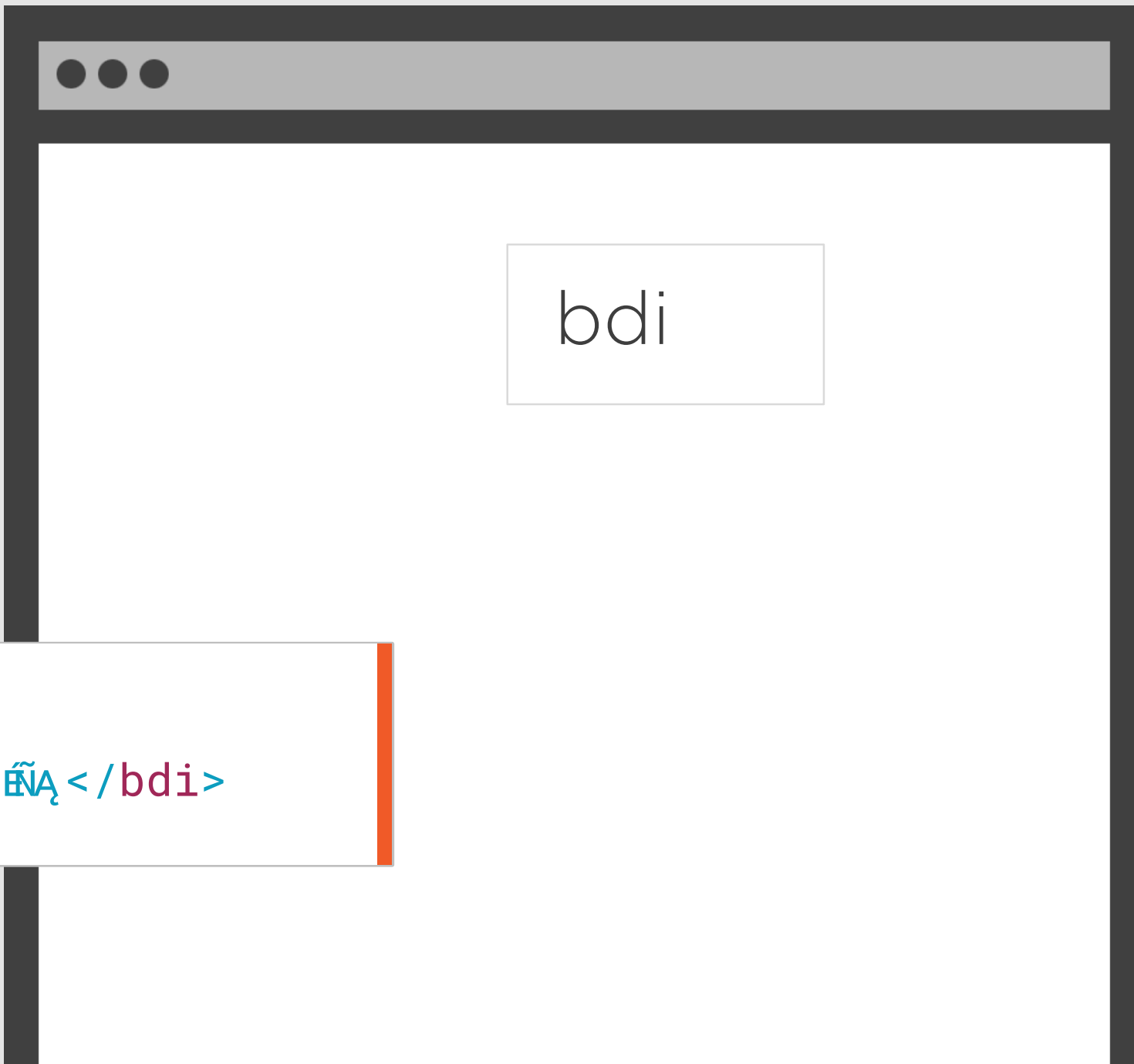
CODE:

```
<mark>
```

```
  highlighted text
```

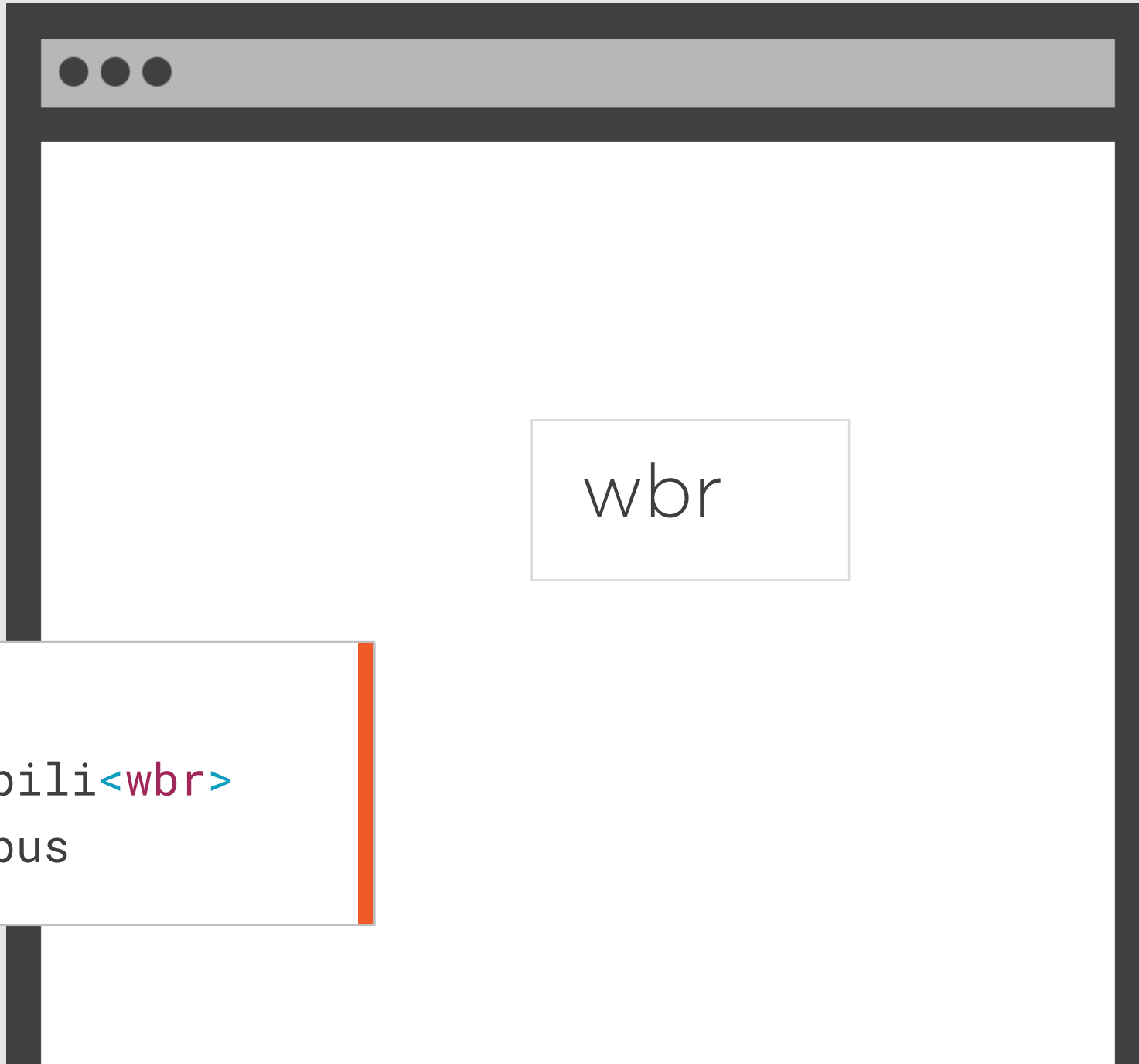
```
</mark>
```





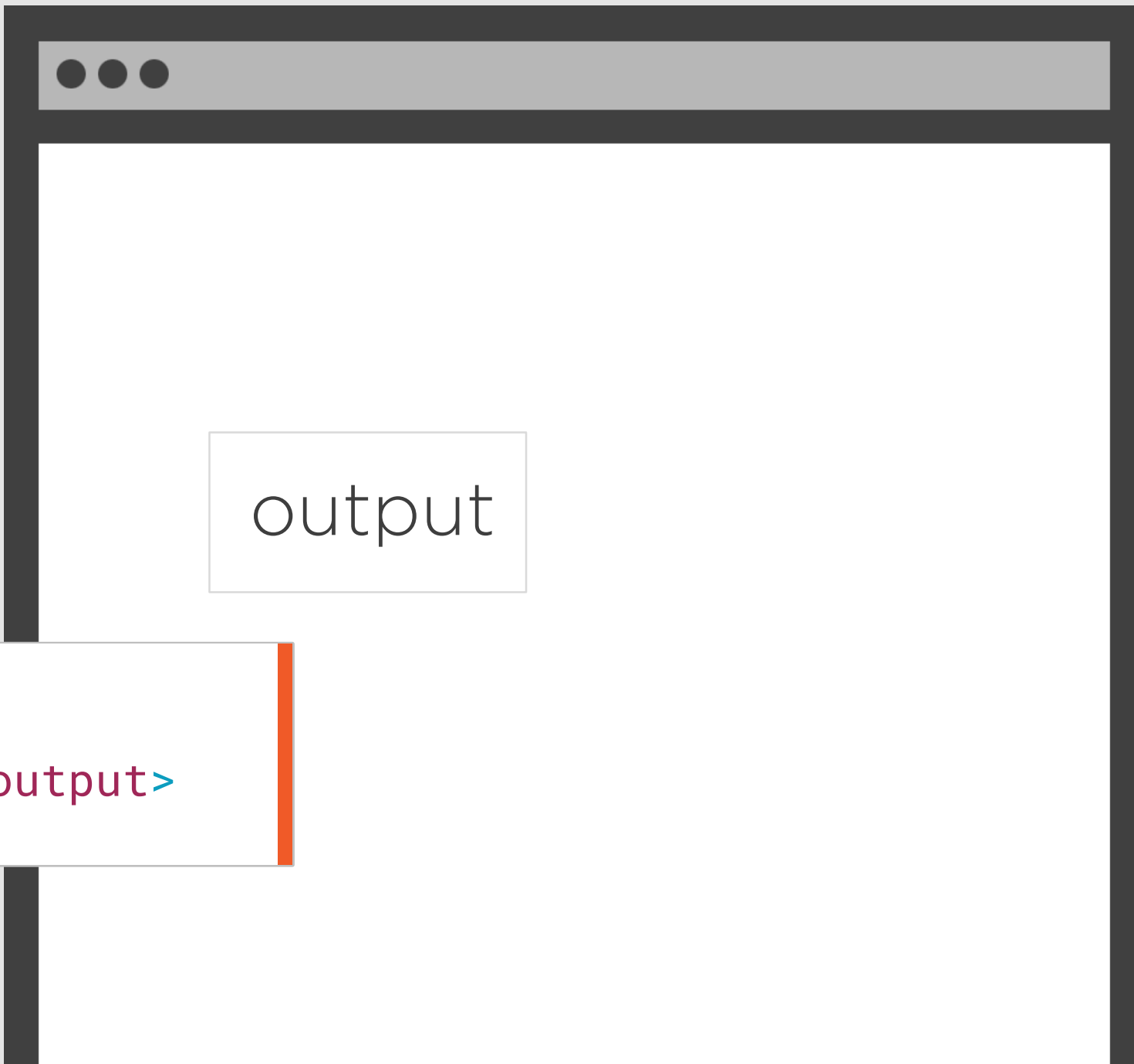
CODE:

```
<bdi>!òÑÊ òËŦ</bdi>
```



**CODE:**

```
Honorificabili<wbr>  
tudinibus
```



output

CODE:

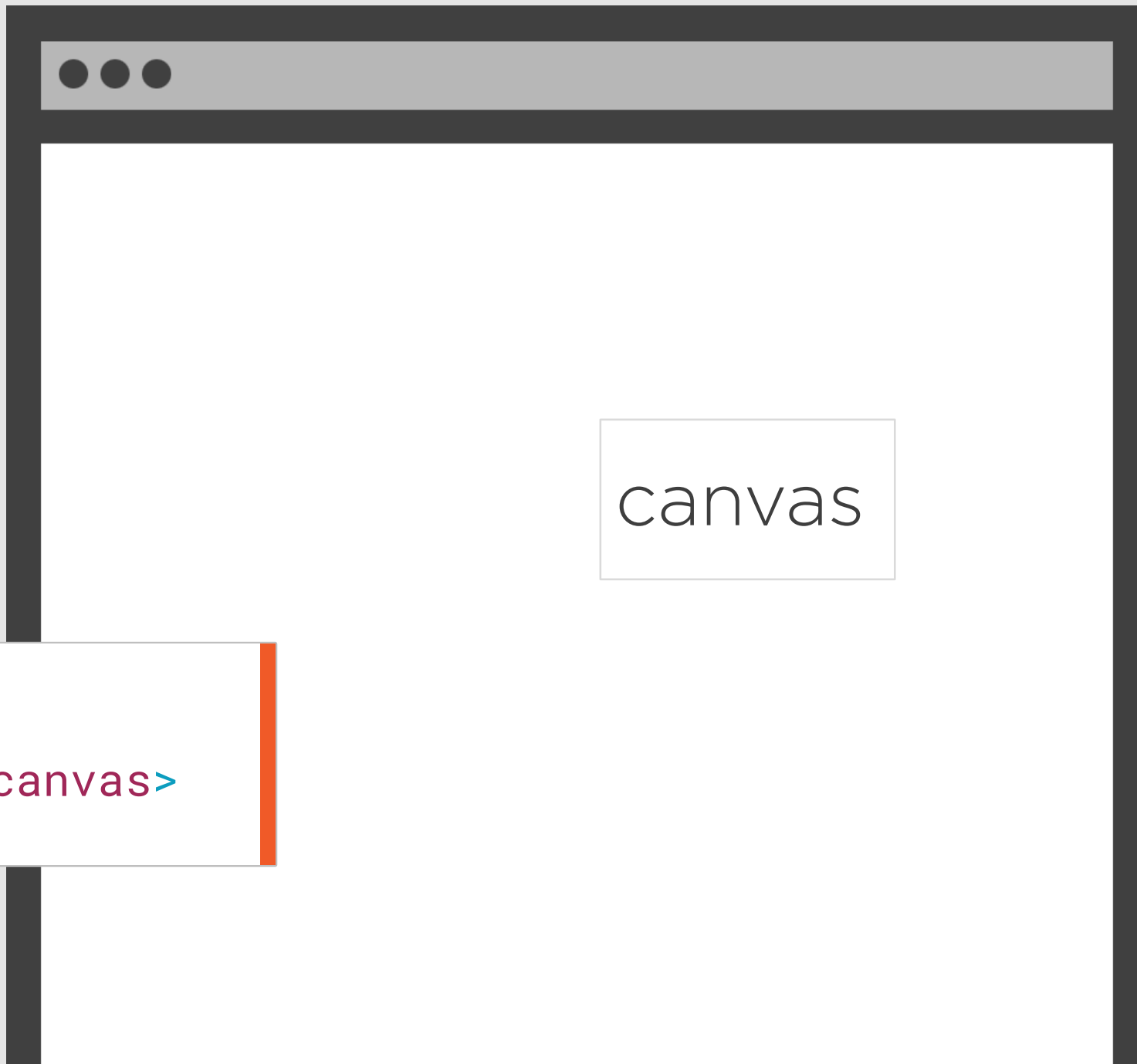
<output></output>



embed

**CODE:**

```
<embed  
  src="intro.mov">
```



**CODE:**

```
<canvas></canvas>
```

## CODE:

```
<video>  
  <source src="vid.mp4">  
  <source src="vid.ogg">  
  <source src="vid.webm">  
  <track  
    kind="subtitles"  
    label="Spanish Subtitles"  
    src="es.vtt"  
    srclang="en">  
</video>
```

video  
source  
track

## CODE:

```
<meter  
  min="0"  
  min="100"  
  min="70">  
    70 out of 100  
</meter>
```



**CODE:**

```
<progress  
  max="100"  
  value="50">  
</progress>
```

progress






$$\sigma = \frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2$$

CODE:

```
<math>  
  <!-- MathML elements -->  
</math>
```

## CODE:

```
<input  
  type="text"  
  list="colors"  
  min="70">  
  
<datalist id="colors">  
  <option src="blue">  
  <option src="red">  
</datalist>
```

datalist

# New Elements

article  
aside  
audio  
bdi  
canvas  
datalist  
details  
embed  
figcaption  
figure  
footer

header  
main  
math  
mark  
meter  
nav  
output  
progress  
section  
source  
summary

svg  
time  
track  
video  
wbr



# New Elements

article

aside

audio

bdi

canvas

datalist

details

embed

figcaption

figure

footer

header

main

math

mark

meter

nav

output

progress

section

source

summary

svg

time

track

video

wbr



# New JavaScript APIs

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## The Web platform: Browser technologies

### Core platform

- 🔍 HTML [u](#) [t](#)
- 🔍 DOM [t](#)
- 🔍 ECMAScript and [🔍](#) JavaScript [t](#)
- 🔍 URL [t](#)
- 🔍 Fetch (includes CORS) [u](#) [u](#) [t](#) [t](#) [t](#) [t](#)
- 🔍 XMLHttpRequest [u](#) [m](#) [t](#) [t](#)
- 🔍 Encoding

### CSS features

- 🔍 CSS roadmap [u](#) [t](#)
- 🔍 Animations [u](#) [m](#) [t](#) [t](#) [t](#)
- 🔍 Background-image options [u](#) [t](#)
- 🔍 Border images [u](#) [m](#) [t](#)
- 🔍 Border radius (rounded corners) [u](#) [m](#) [t](#)
- 🔍 Box shadows [u](#) [m](#) [t](#) [t](#)
- 🔍 Box sizing [u](#) [m](#) [t](#)
- 🔍 Cascading and inheritance [m](#)
- 🔍 Colors [u](#) [m](#) [t](#)
- 🔍 Compositing and Blending [u](#) [t](#)
- 🔍 Device Adaptation [u](#)
- 🔍 Downloadable fonts (@font-face) [u](#) [m](#) [t](#) [t](#) [t](#)
- 🔍 Exclusions [u](#) [t](#)
- 🔍 Feature queries (@supports) [u](#) [m](#) [t](#)

- 🔍 Writing modes [t](#)
- 🔍 CSSOM (CSS Object Model) [t](#)
- 🔍 CSSOM View Module [t](#)

### Graphics and typography

- 🔍 Canvas [u](#) [t](#) [t](#)
- 🔍 WebGL [u](#) [t](#) [t](#)
- 🔍 SVG [u](#) [t](#) [t](#)
- 🔍 WOFF [u](#) [t](#)
- 🔍 MathML [u](#) [m](#) [t](#)
- 🔍 Web Animations [u](#) [m](#) [t](#) [t](#)

### Media

- 🔍 Web Audio API [t](#)
- 🔍 WebVTT [t](#)
- 🔍 Media Source Extensions [t](#)
- 🔍 Media Fragments

### Platform interaction, events, messaging

- 🔍 Notifications API [u](#) [t](#)
- 🔍 Cross-document messaging [u](#) [m](#) [t](#) [t](#) [t](#)
- 🔍 Channel messaging
- 🔍 Fullscreen API [u](#) [m](#)
- 🔍 Geofencing
- 🔍 Geolocation [u](#) [t](#) [t](#)

- 🔍 dataset (data-\* attributes) [u](#) [t](#) [t](#) [t](#)
- 🔍 async for scripts [u](#) [m](#) [t](#)
- 🔍 defer for scripts [u](#) [m](#)
- 🔍 Session-history management [u](#) [m](#) [t](#) [t](#) [t](#)
- 🔍 hashchange [u](#) [m](#) [t](#)
- 🔍 Sandboxed iframe [u](#) [m](#) [t](#)
- 🔍 Drag and drop [u](#) [t](#) [t](#) [t](#)
- 🔍 contentEditable [u](#) [t](#)
- 🔍 HTML Editing APIs
- 🔍 ARIA [u](#)

### Performance optimization and analysis

- 🔍 Web Workers [u](#) [m](#) [t](#) [t](#) [t](#)
- 🔍 Shared Workers [u](#)
- 🔍 Timing control for script-based animations [u](#) [t](#) [t](#)
- 🔍 Navigation Timing [u](#) [m](#) [t](#)
- 🔍 Page Visibility [t](#)
- 🔍 User Timing [t](#)
- 🔍 Performance Timeline [t](#)
- 🔍 High Resolution Time [t](#)
- 🔍 SIMD (Single instruction, multiple data)

### Security and privacy

- 🔍 Content Security Policy (CSP) [t](#)
- 🔍 Upgrade Insecure Requests



# Graphics and Typography



**Canvas**



**Web Animations**

# Interaction, Events & Messaging



**Battery Status**



**Clipboard API &  
Events**



**Cross Document  
Messaging**



**Device & Screen  
Orientation**



**Fullscreen**





# Interaction, Events & Messaging



**Geolocation**



**Media Capture**



**Notifications**

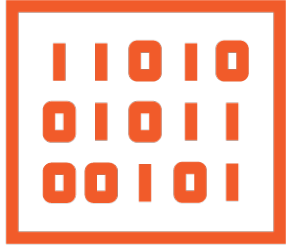


**Touch Events**



**Vibration**

# Storage & Files



**Blob URLs**



**File API**



**File Reader**



**IndexedDB**

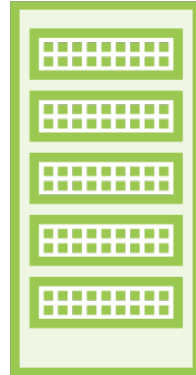


**Local Storage**

# Real-Time Communication



**Push API**

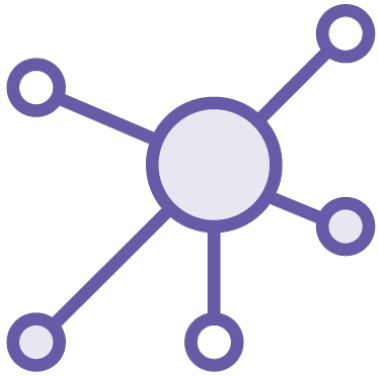


**Server-Sent Events**



**Web Sockets**

# Web Components



**Custom  
Elements**



# Standard Markup

```
<div id="comment-container">
  <div class="comment">
    <div class="user-info-container">
      <div class="user-name">Craig Shoemaker</div>
      <div class="avatar">
      </div>
    </div>
    <div class="content-container">
      <div class="publish-date">12/01/2016</div>
      <div class="content">HTML5 is a set of markup enhancements
                           and new JavaScript APIs</div>
    </div>
  </div>
</div>
```

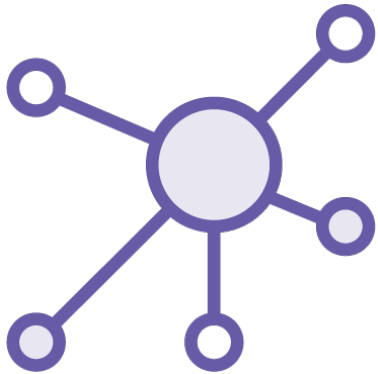


# Custom Elements

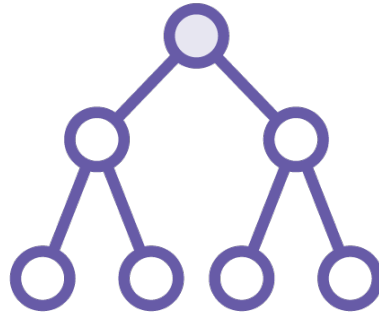
```
<comments>  
  <comment author="Craig Shoemaker"  
    avatarUrl="images/cs.png"  
    publishDate="12/01/2016">  
    HTML5 is a set of markup enhancements and new JavaScript APIs.  
  </comment>  
</comments>
```



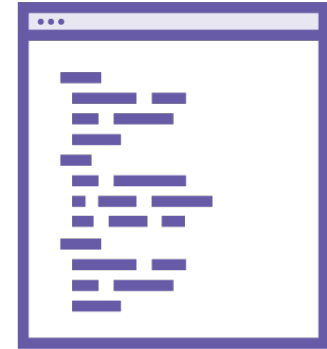
# Web Components



Custom  
Elements



Shadow DOM



Templates

# Performance Optimization & Analysis



**High Resolution  
Time**



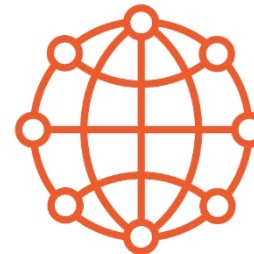
**Navigation Timing**



**Page Visibility**



**User Timing**



**Web Workers**

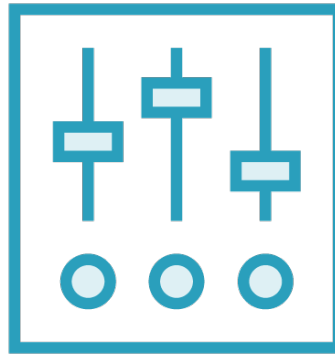




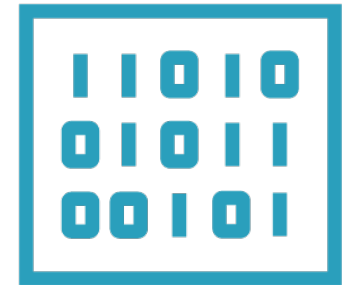
# Security & Privacy



**Content Security  
Policy**



**Referrer Policy**



**Web Cryptography**



# Miscellaneous Features



**scripts:  
async & defer**



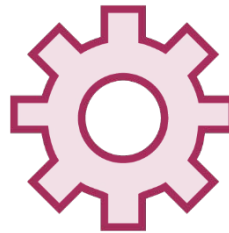
**contentEditable**



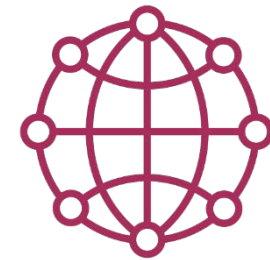
**Drag & Drop**



**History**



**Promises**



**Service Workers**





+



=



# Why



# When



# Shadow DOM - WD

Method of establishing and maintaining functional boundaries between DOM trees and how these trees interact with each other within a document, thus enabling better functional encapsulation within the DOM.

Global 52.02%  
unprefixed: 48.56%  
U.S.A. 43.73%  
unprefixed: 41.84%

Current aligned	Usage relative	Show all							
IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
			45						
8			46					4.3	
9		<sup>1</sup> 43	47					4.4	
10		<sup>1</sup> 44	48			8.4		4.4.4	
11	13	<sup>1</sup> 45	49	9	35	9.2	8	47	49
	14	<sup>1</sup> 46	50	9.1	36	9.3			
		<sup>1</sup> 47	51		37				
		<sup>1</sup> 48	52						

Notes Known issues (0) Resources (9) Feedback

Supported in current WebKit nightly, so may appear in an upcoming Safari version.

MS Edge status: Under Consideration

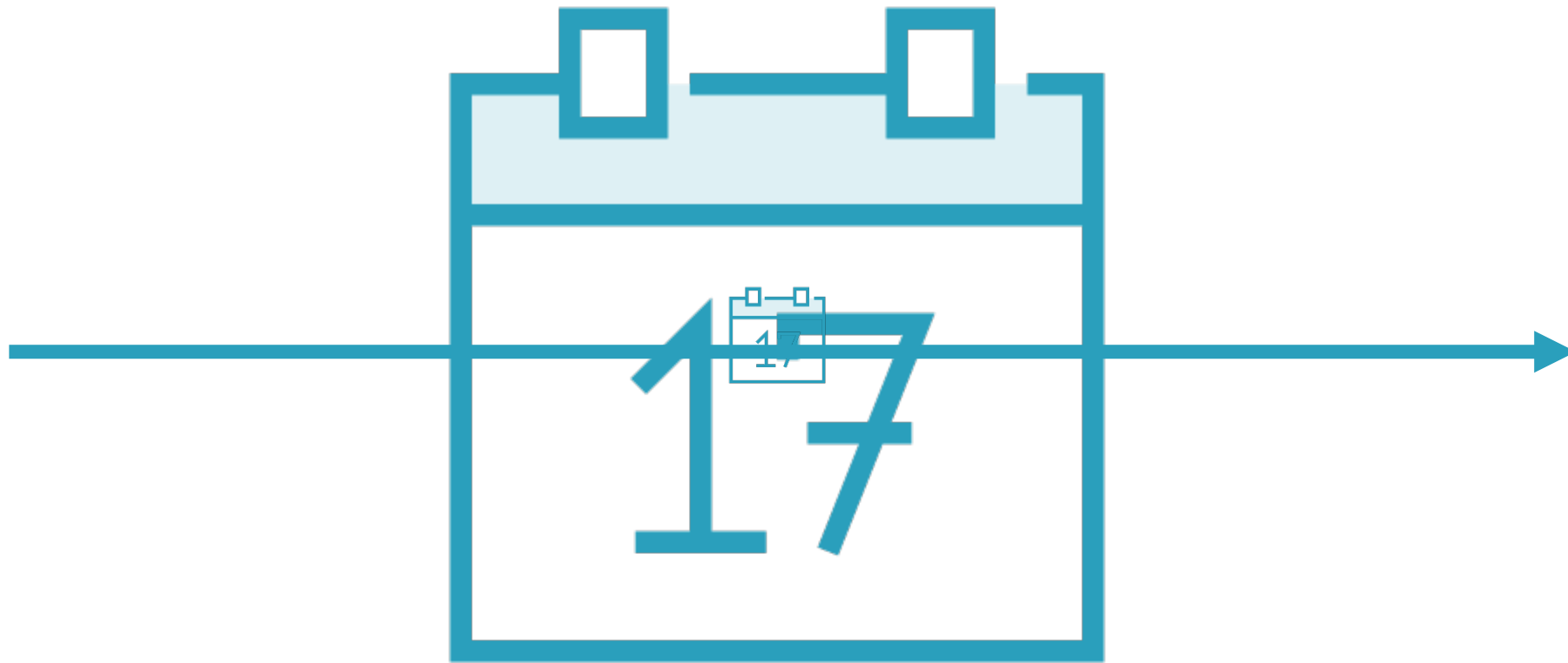
Firefox status: In-development

WebKit status: In Development

<sup>1</sup> Supported in Firefox behind the `dom.webcomponents.enabled` flag.



No Completion Date



# HTML4 vs HTML5

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Demo



# HTML4 vs HTML5



# Getting Started

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Demo



# HTML5 Boilerplate

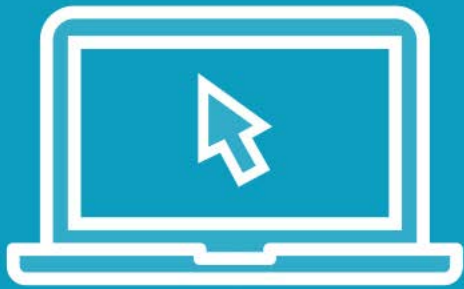


# Detecting Features

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# Demo



**[caniuse.com](https://caniuse.com)**



Demo



**Modernizr**



# Fallbacks & Polyfills

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A large teal circle with the word "Fallback" centered inside in white text.

**Fallback**

A large maroon circle with the word "Polyfill" centered inside in white text.

**Polyfill**





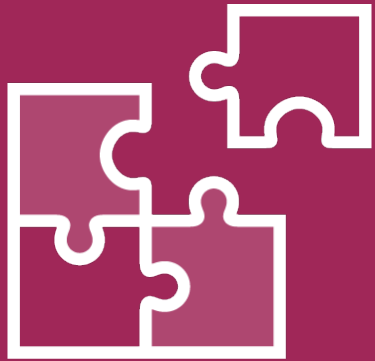
Demo



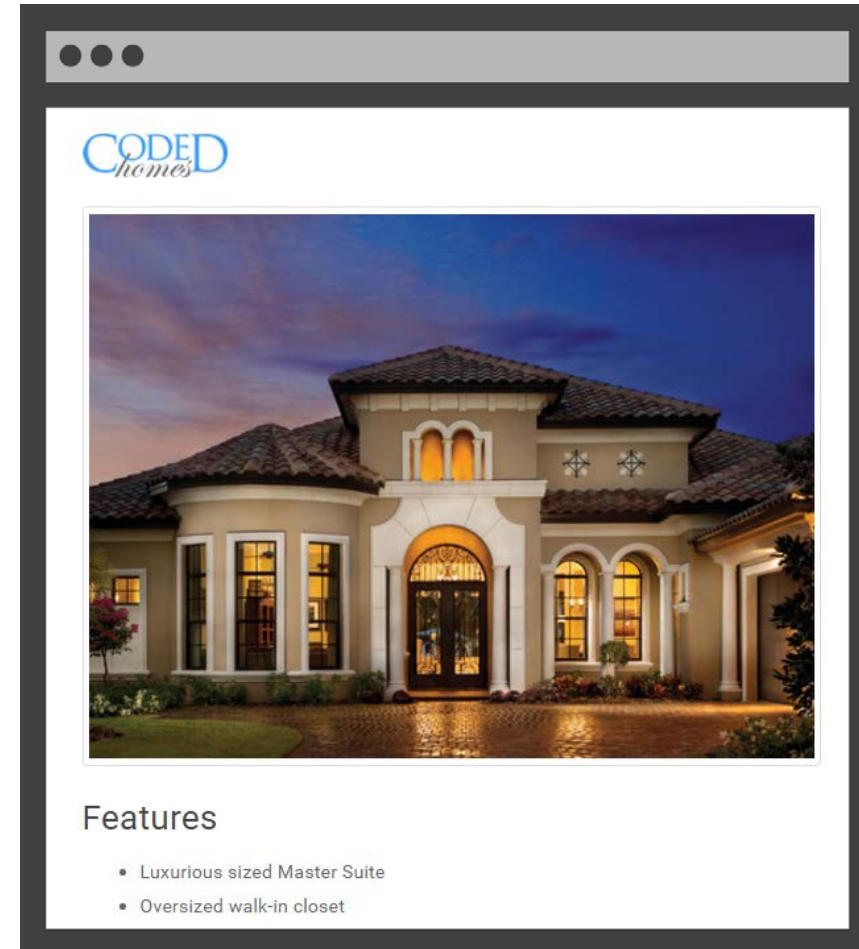
**[HTML5please.com](https://HTML5please.com)**



## Next Module



## Finding Parts of the Page



# Summary



What is HTML5?

**A collection of APIs and markup**

**Many standards bodies**

**Implemented at different rates**

**Easy to get started**

**Fallbacks and Polyfills available**

