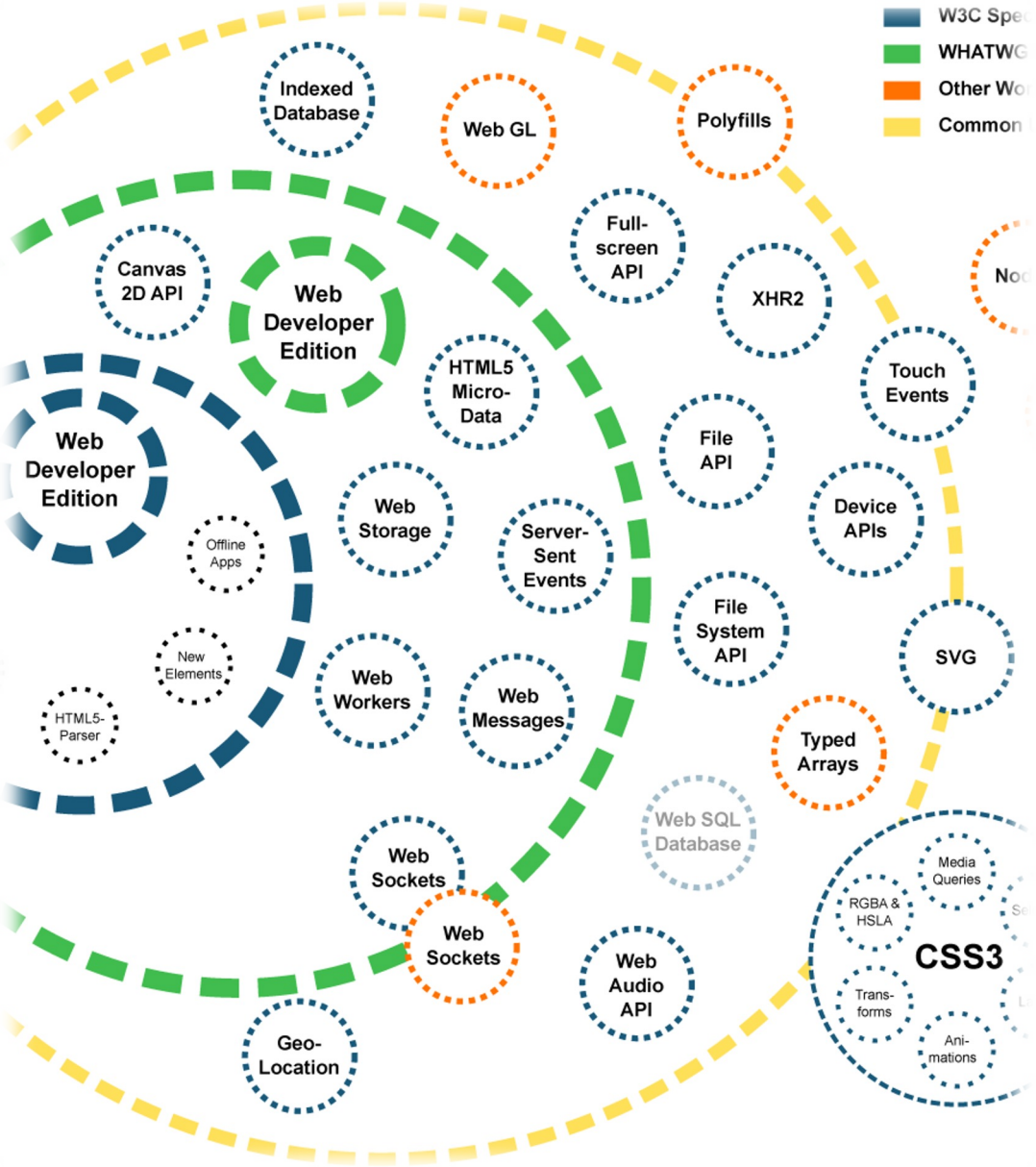
INTRO APPWEB 2023

HTML

(Modern) HTML5

Luigi De Russis



Politecnico di Torino

CC BY NC SA

Goal

- Discovering the essential features of HTML
  - Document structure and syntax
  - Essential elements
  - Semantic elements
  - Page structuring
- Aligned to what HTML 5 looks like in year 2023

Rough Timeline of Web Technologies

HTML
- CERN
- 1991

HTML 2.0
- IETF
- 1995

HTML 3.2
- W3C
- 1997

HTML 4.01
- 1999

XHTML 1.0
- W3C
- 2000
- XML-based; discontinued

HTML5
- WHATWG
  - and W3C
- 2014

W3C: World Wide Web Consortium

WHATWG: Web Hypertext Application Technology Working Group

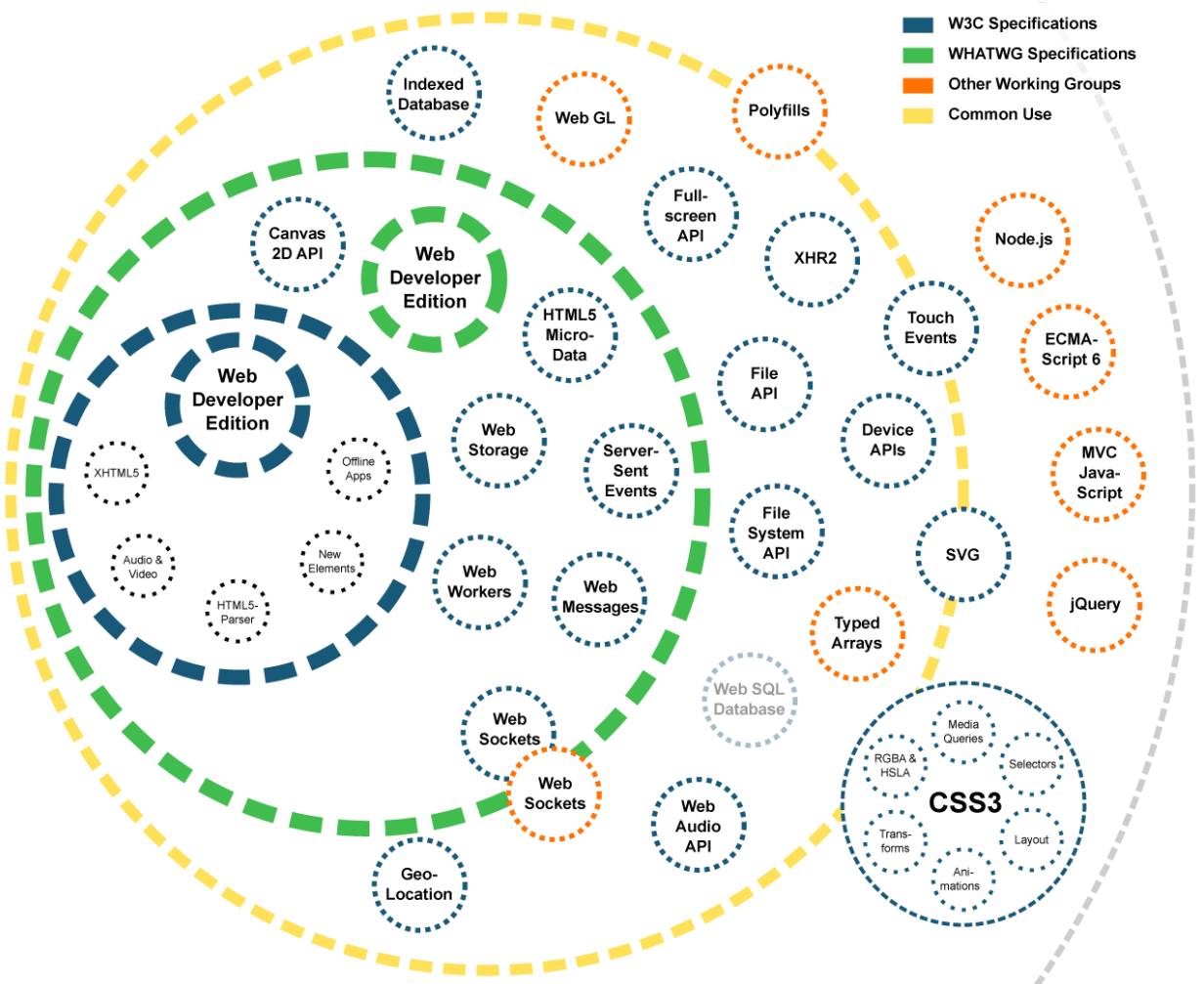
https://html.spec.whatwg.org/multipage/

https://html.spec.whatwg.org/dev/

A Different Approach

HTML 4.01	HTML 5
web pages	web applications
design	user interaction

HTML 5: a Family of Standards

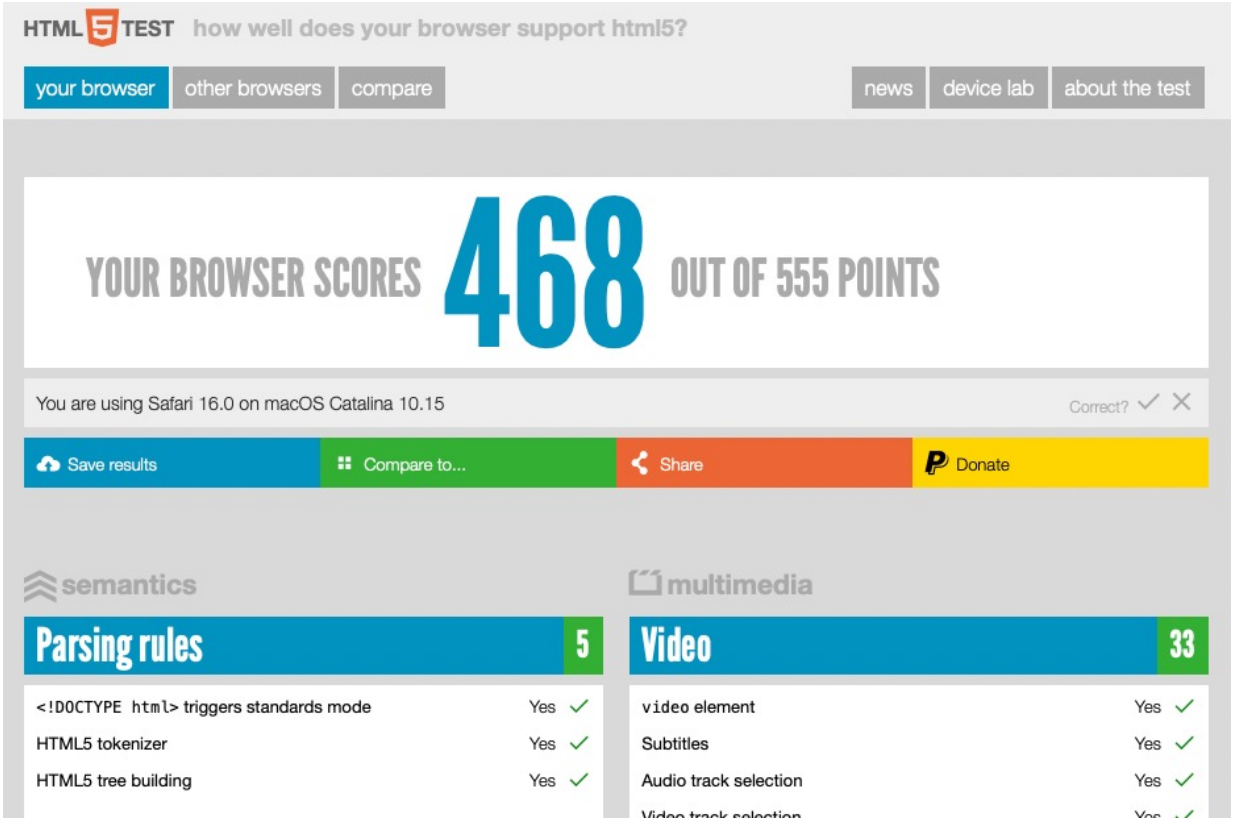


Live Standard: Browser Compatibility?

- https://caniuse.com/

HTML5 test

- How well does your browser support HTML5?
- http://html5test.com



A Basic HTML Document

```
<!DOCTYPE html>
<html lang="en">
 <head>
  <title>Sample page</title>
 </head>
 <body>
  <h1>Sample page</h1>
  <p>This is a <a href="demo.html">simple</a> sample.</p>
  <!-- this is a comment -->
 </body>
</html>
```

- *Unicode* Text File
- DOCTYPE declaration
- Nested tree of Elements
  - Strict nesting
- Element:
  - Start tag: `<a>`
  - Attribute: `href="demo.html"`
    - Name=value pairs
  - End tag: `</a>`
  - Inner text: `simple`

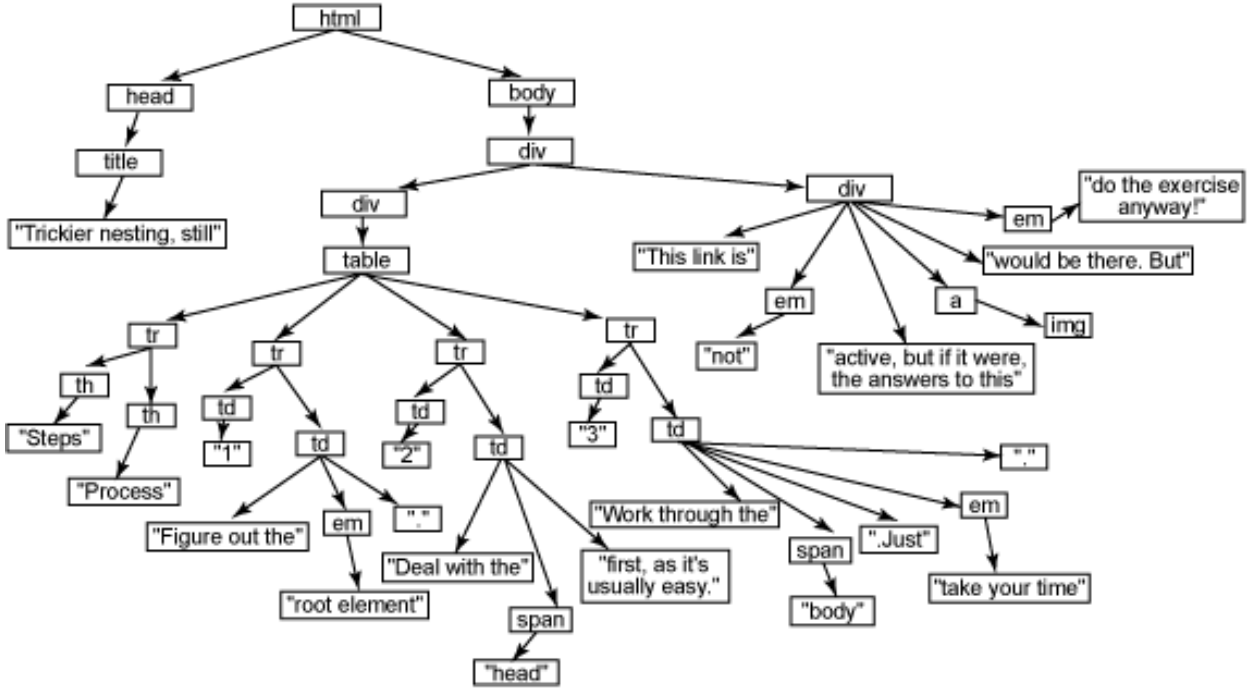
Mandatory Structure

- First line: `<!DOCTYPE html>`
- `<html>` root element, contains the whole file
  - `<head>` (title, other metadata, load style sheets, load JavaScript code)
  - `<body>` (actual page content)

```
<!DOCTYPE html>
<html lang="en">
 <head>
  <title>Sample page</title>
 </head>
 <body>
  <h1>Sample page</h1>
  <p>This is a <a href="demo.html">simple</a> sample.</p>
  <!-- this is a comment -->
 </body>
</html>
```

Document Object Model (DOM)

- Browser's internal representation of a web page
- Obtained through parsing HTML
  - Example of parsed HTML tree structure

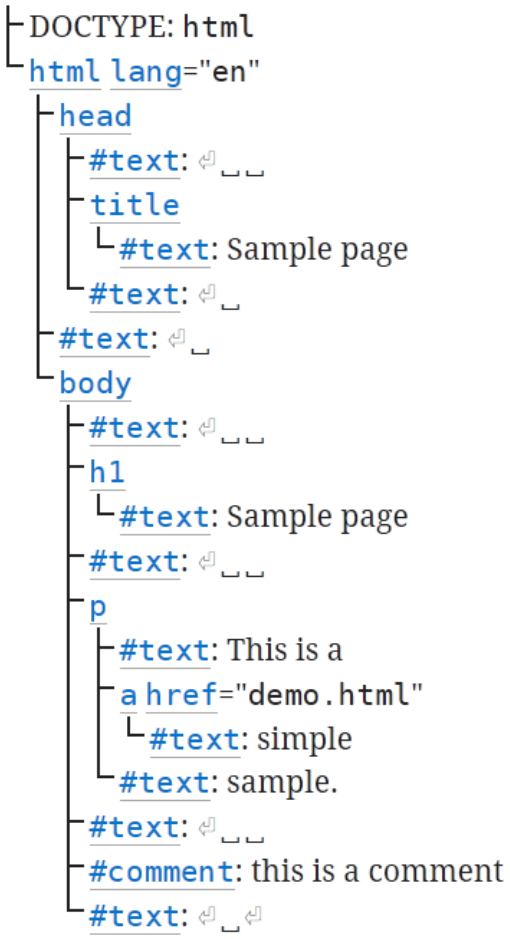


https://flaviocopes.com/dom/

HTML Parsing Into a DOM Tree

```
<!DOCTYPE html>
<html lang="en">
 <head>
  <title>Sample page</title>
 </head>
 <body>
  <h1>Sample page</h1>
  <p>This is a <a href="demo.html">simple</a> sample.</p>
  <!-- this is a comment -->
 </body>
</html>
```

Parsing

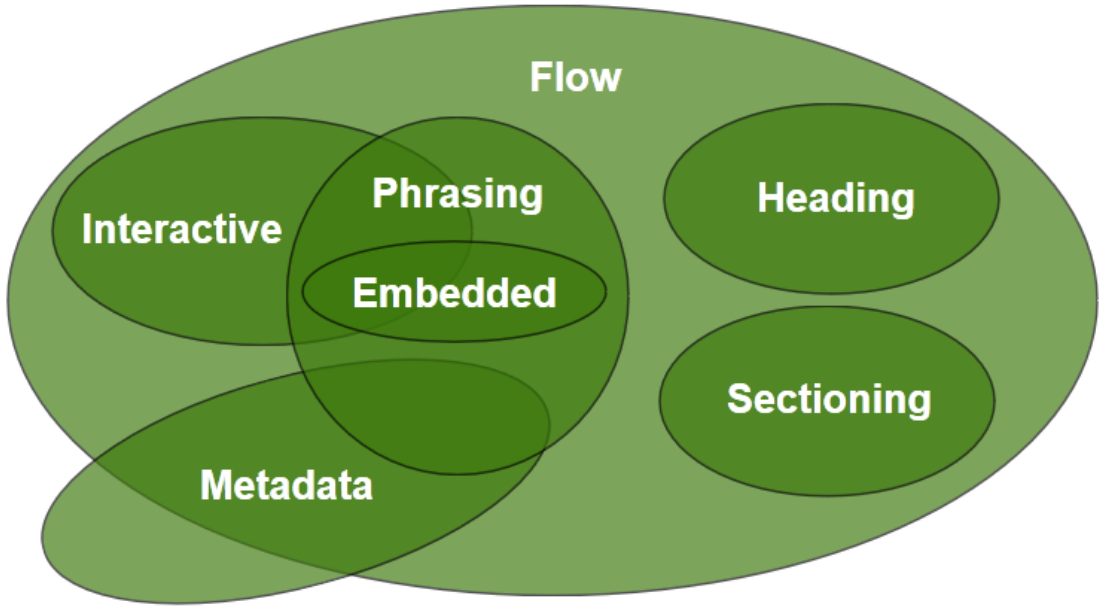


HTML Elements

- Elements are used to define the *meaning* of a portion of a document
  - Semantic markup
- The meaning will be rendered graphically, according to the style sheets
  - No HTML code should deal with presentation issues

- Each element has a default *display* value
  - `display:block`
    - Full-width
    - Starts on a new line
    - Top-to-bottom layout
  - `display:inline`
    - Does not start a new line
    - Occupies just the necessary space
    - Left-to-right layout
    - Wraps around at the end of line

Categories of HTML Elements



- *Sectioning* content defines headings and footers
- *Heading content* defines the header of a section
- *Phrasing* content is the *text* of the document, as well as elements that mark up that text *at the intra-paragraph level*.
  - Runs of phrasing content form paragraphs.
- *Flow* content includes most types of elements

https://html.spec.whatwg.org/dev/dom.html#kinds-of-content

Sections and Headings (Block)

Sectioning content

- `article`
- `aside`
- `nav`
- `section`

- `header`
- `footer`

Heading content

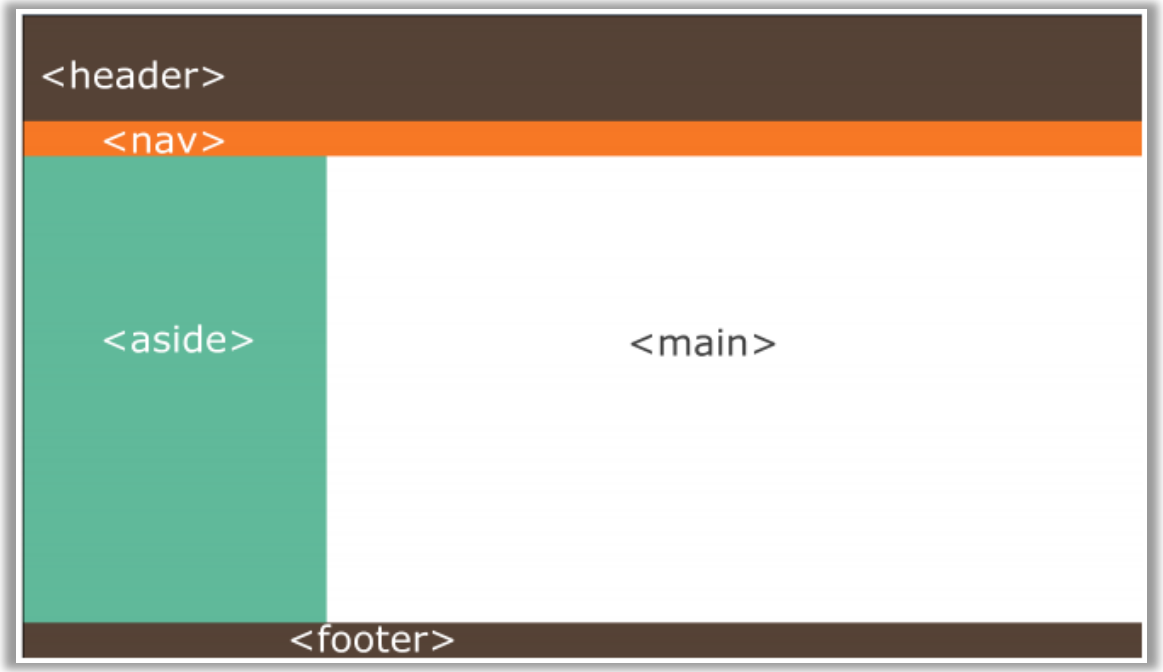
- `h1`
- `h2`
- `h3`
- `h4`
- `h5`
- `h6`
- `hgroup`

Usage Guide

Element	Usage
<article>	complete, or self-contained, composition in a document, page, application, or site and that is, in principle, independently distributable or reusable
<section>	A generic section of a document or application. A thematic grouping of content, typically with a heading
<nav>	A section of a page that links to other pages or to parts within the page: a section with navigation links
<aside>	A section of a page that consists of content that is tangentially related to the content around the aside element, and which could be considered separate from that content (such as sidebars)
<h1>-<h6>	A section heading
<hgroup>	The heading of a section, that groups multiple h1-h6 elements, e.g., in case of subheadings
<header>	A group of introductory or navigational aids
<footer>	typically contains information about its section such as who wrote it, links to related documents, copyright data, and the like

https://html.spec.whatwg.org/dev/sections.html#usage-summary-2

Typical Layout




```
<body>
    <header>
        <nav>

        </nav>
    </header>
    <aside>

    </aside>
    <main>

    </main>
    <footer>

    </footer>
</body>
```

Grouping Content (Block)

Element	Usage
<p>	a paragraph of text
<hr>	horizontal rule (represents a paragraph-level thematic break)
<pre>	block of preformatted text
<blockquote>	a section that is quoted from another source
	a list of items, where the items have been intentionally ordered. The items of the list are elements
	a list of items, where the order of the items is not important. The items of the list are elements
<menu>	an unordered list , whose elements are commands that may be executed
<dl>	a list of definitions. Each definition has a name (<dt>, definition term) and a value (<dd>, definition description)
<figure>	a sectioning element that can be used to annotate illustrations, diagrams, photos, code listings, etc. May include <img> or other content. May include <figcaption>
<main>	represents the dominant contents of the document
	the element has no special meaning at all. It can be used with the class, and title attributes to mark up semantics common to a group of consecutive elements. Use as a last resort.

https://html.spec.whatwg.org/dev/grouping-content.html

Phrasing Content (Inline)

- a
- abbr
- audio
- b
- br
- button
- canvas
- cite
- code
- data
- datalist
- del
- dfn
- em
- embed
- i
- img
- input
- ins
- kbd
- label
- mark
- output
- picture
- progress
- q
- s
- samp
- select
- slot
- small
- span
- strong
- sub
- sup
- template
- textarea
- time
- var
- video
- wbr

- Insert content or format content inside a single paragraph
- Normally formatted left-to-right, and wrap at the end of line

https://html.spec.whatwg.org/dev/text-level-semantics.html

Interactive Content (Inline)

- a
- audio
- button
- details
- embed
- iframe
- input
- label
- select
- textarea
- video

- Elements specifically intended for user interaction
- May be used to compose a form
- May include multimedia interactive content
- In the simplest form, they may just be a link
  - `<a href="URL">anchor</a>`

Tabular Data

- `<table>` container
- `<thead>` groups header rows, `<tbody>` groups data rows, `<tfoot>` groups summary rows
- `<tr>` table row, includes
  - `<td>` cell with table data
  - `<th>` cell with table heading
- May have a `<caption>`
- `<colgroup>` may apply common attributes to a set of `<col>` columns
- `rowspan` and `colspan` attributes for creating complex grids

Data about the planets of our solar system (Planetary facts taken from Nasa's Planetary Fact Sheet - Metric.

		Name	Mass (10^{24}kg)	Diameter (km)	Density (kg/m^3)	Gravity (m/s^2)	Length of day (hours)	Distance from Sun (10^6km)	Mean temperature (°C)	Number of moons	Notes
Terrestial planets		Mercury	0.330	4,879	5427	3.7	4222.6	57.9	167	0	Closest to the Sun
		Venus	4.87	12,104	5243	8.9	2802.0	108.2	464	0	
		Earth	5.97	12,756	5514	9.8	24.0	149.6	15	1	Our world
		Mars	0.642	6,792	3933	3.7	24.7	227.9	-65	2	The red planet
Jovian planets	Gas giants	Jupiter	1898	142,984	1326	23.1	9.9	778.6	-110	67	The largest planet
		Saturn	568	120,536	687	9.0	10.7	1433.5	-140	62	
	Ice giants	Uranus	86.8	51,118	1271	8.7	17.2	2872.5	-195	27	
		Neptune	102	49,528	1638	11.0	16.1	4495.1	-200	14	
Dwarf planets		Pluto	0.0146	2,370	2095	0.7	153.3	5906.4	-225	5	Declassified as a planet in 2006, but this remains controversial.

Key Attributes (Applicable To All Elements)

`class="aa bb cc"`

- Space-separated list of class identifiers
- Represents all the classes that this elements belongs to
- Heavily used in CSS and JS for matching portions of contents

`id="unique"`

- Represents an element's unique identifier
- Must be unique within this specific HTML document
- Heavily used in CSS and JS for finding/matching this specific element

Key Attributes (Applicable To All Elements)

`style="css fragment"`

- Apply a set of CSS declarations to this specific HTML element
- **Avoid** when possible, prefer CSS rules that map to element `id` and `class`

“Wildcard” Elements

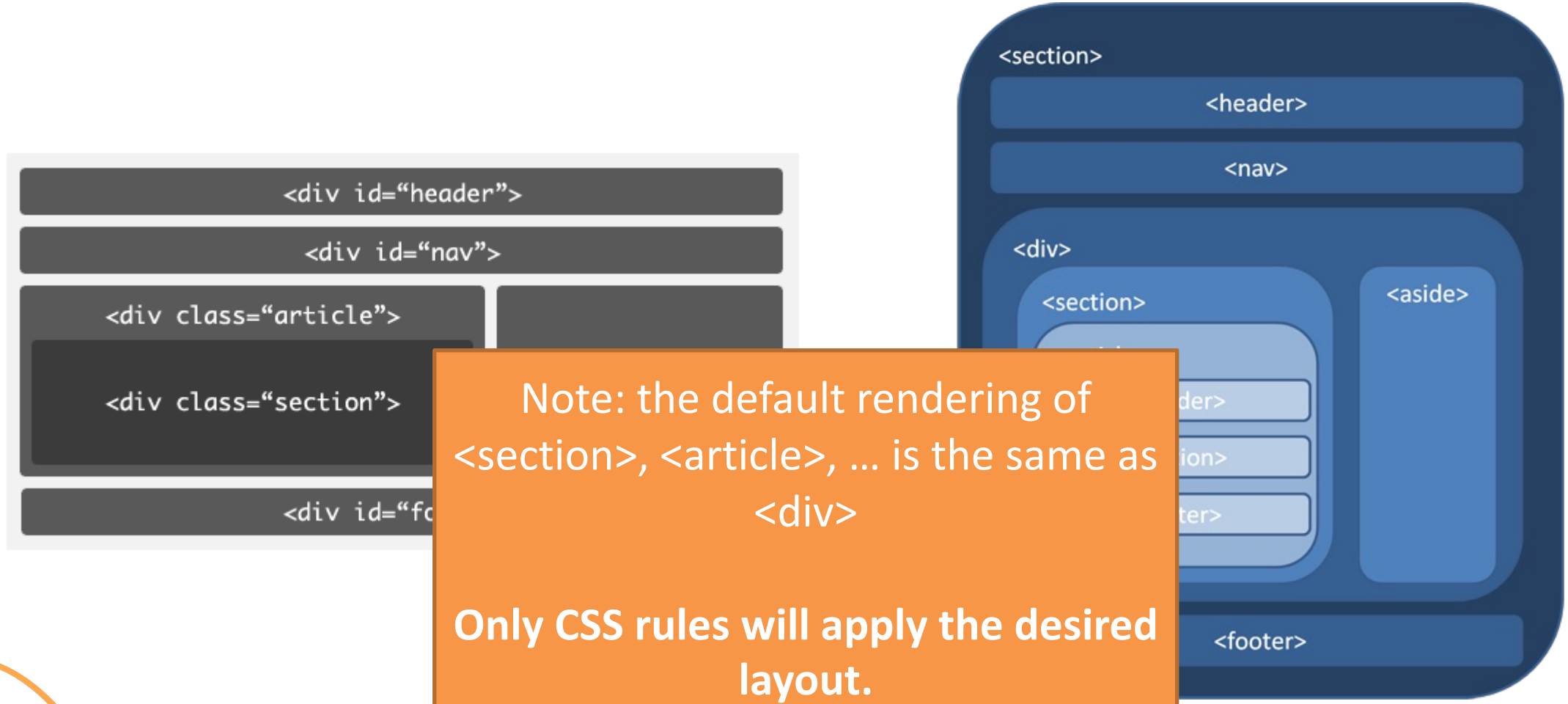
** … **

- Block-level container element
- No predefined semantics
- Invisible layout
- Used to mark-up blocks or groups of blocks, with specific classes

…

- Inline-level container element
- No predefined semantics
- Invisible layout
- Used to mark-up parts of a paragraph, with specific classes

Opaque vs. Semantic elements



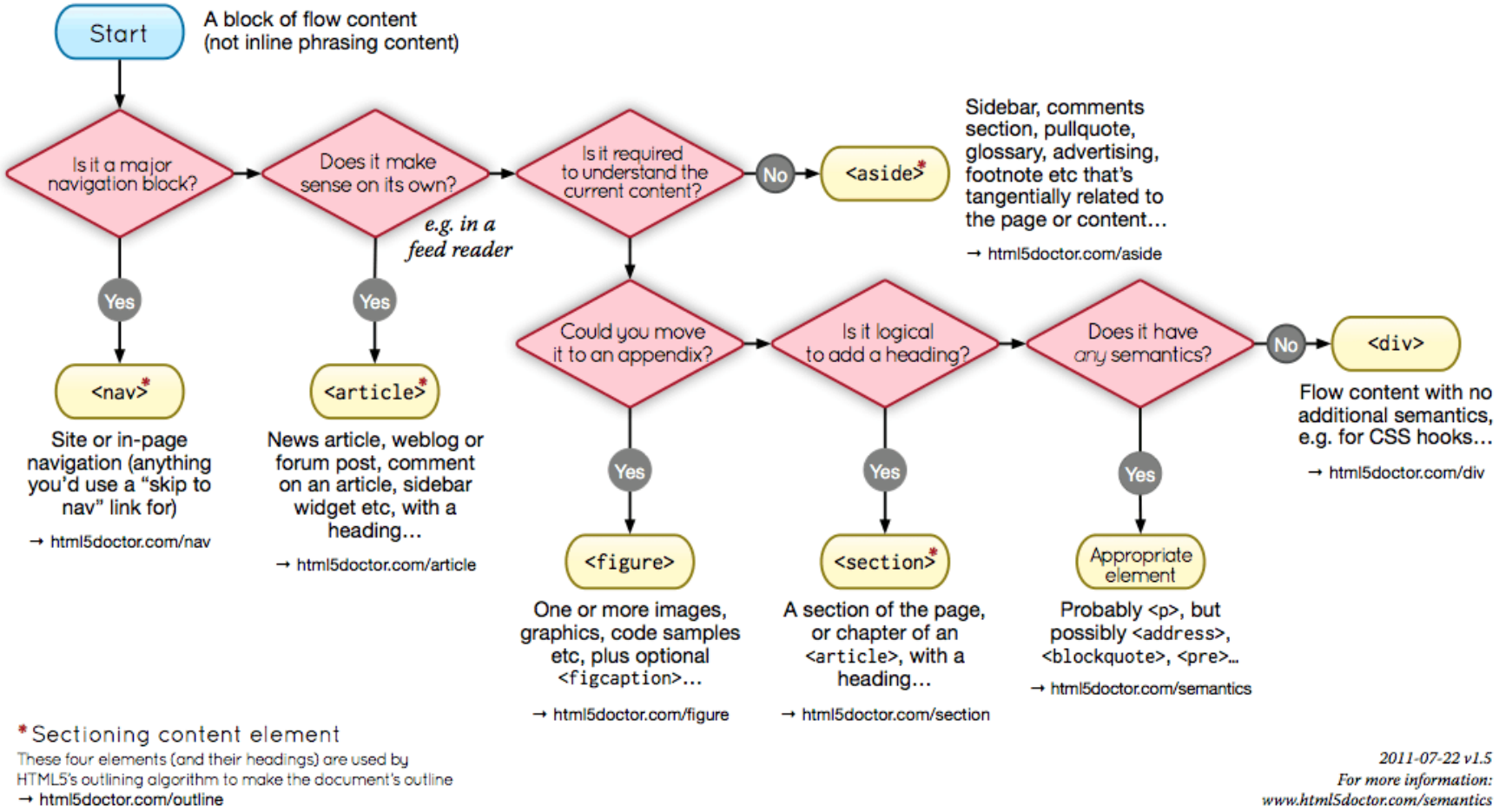
Note: the default rendering of <section>, <article>, … is the same as

Only CSS rules will apply the desired layout.

HTML5 Element Flowchart

Sectioning content elements and friends

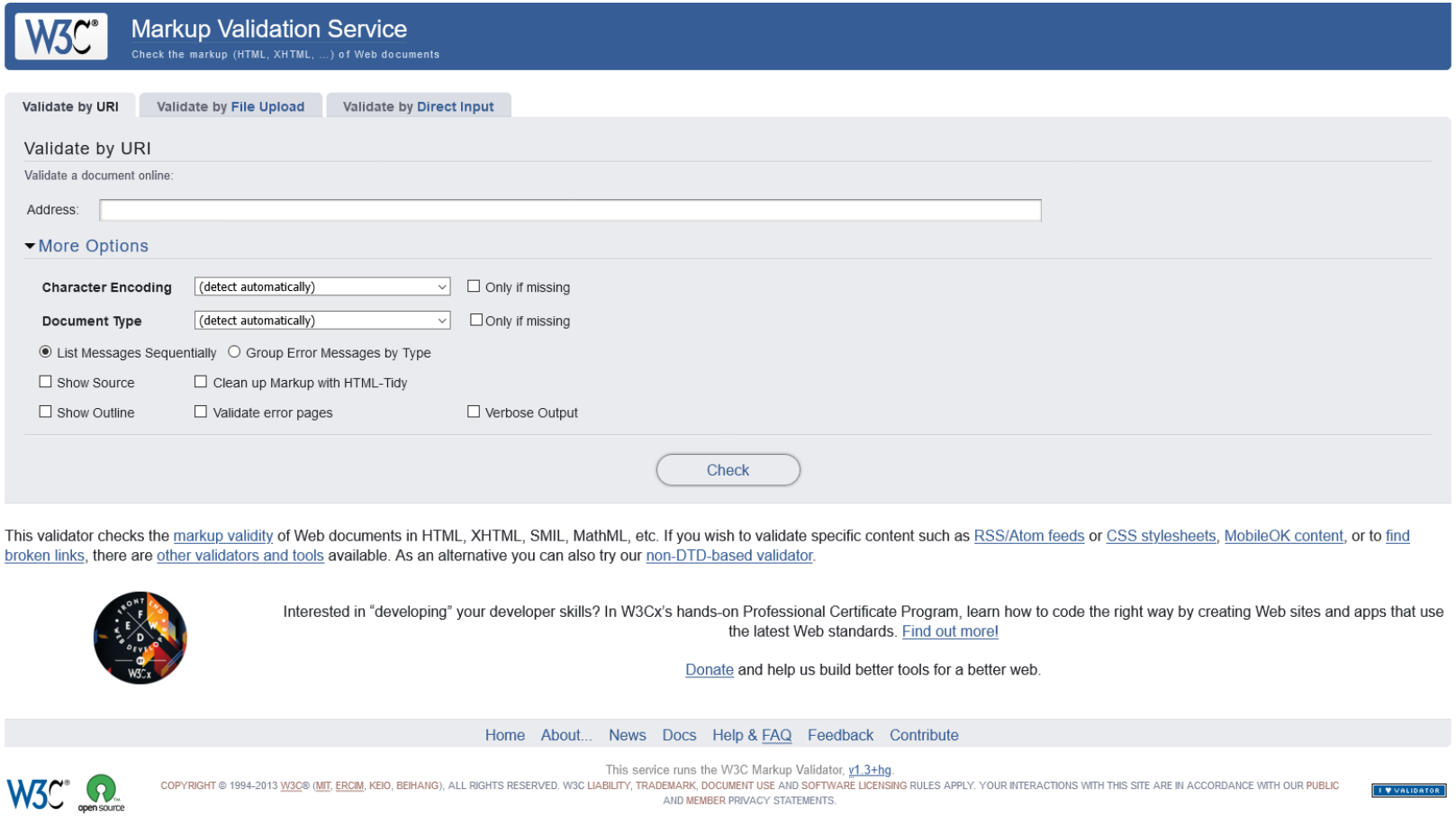
By @riddle & @boblet
www.html5doctor.com



*Sectioning content element
These four elements (and their headings) are used by HTML5's outlining algorithm to make the document's outline
→ html5doctor.com/outline

2011-07-22 v1.5
For more information:
www.html5doctor.com/semantics

HTML Validator



https://validator.w3.org/

References

- HTML: The Living Standard, Developer's Edition — Last Updated 4 October 2022 - https://html.spec.whatwg.org/dev/
- MDN: HTML: Hypertext Markup Language - https://developer.mozilla.org/en-US/docs/Web/HTML
- A Modern HTML Introductory Tutorial - http://fastwebstart.com/modern-html-tutorial/ (and linked resources)
- https://css-tricks.com/what-beautiful-html-code-looks-like/

License

- These slides are distributed under a Creative Commons license “**Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)**”
- **You are free to:**
  - **Share** — copy and redistribute the material in any medium or format
  - **Adapt** — remix, transform, and build upon the material
  - The licensor cannot revoke these freedoms as long as you follow the license terms.
- **Under the following terms:**
  - **Attribution** — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
  - **NonCommercial** — You may not use the material for commercial purposes.
  - **ShareAlike** — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.
  - **No additional restrictions** — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.
- https://creativecommons.org/licenses/by-nc-sa/4.0/