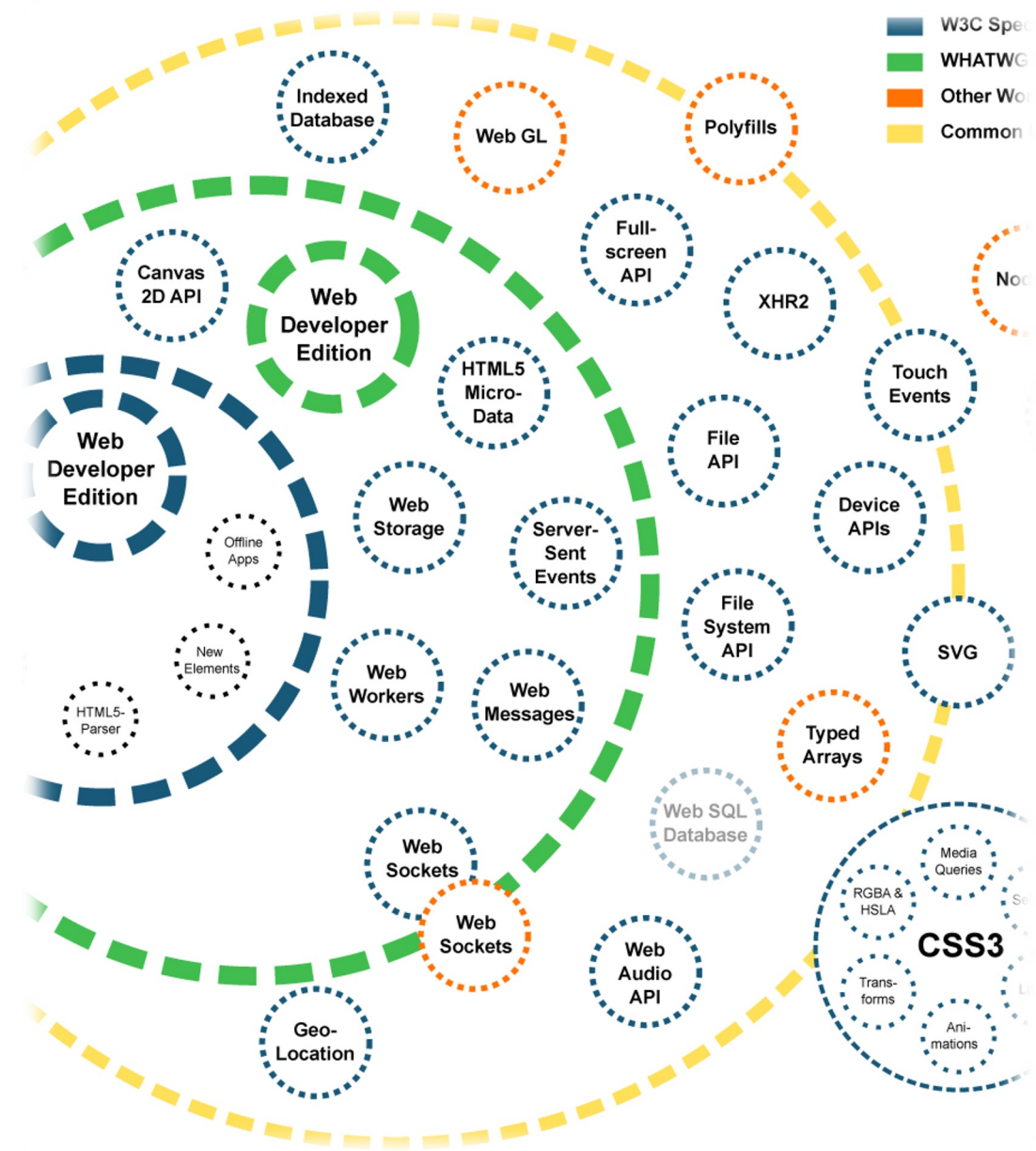# HTML

(Modern) HTML5

Luigi De Russis

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 2022

Rough Timeline of Web Technologies

HTML
- CERN
- 1991

HTML 2.0
- IETF
- 1995

HTML 3.2
- W3C
- 1997

W3C: World Wide Web Consortium

HTML 4.01
- 1999

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

HTML5
- WHATWG
  - and W3C
- 2014

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
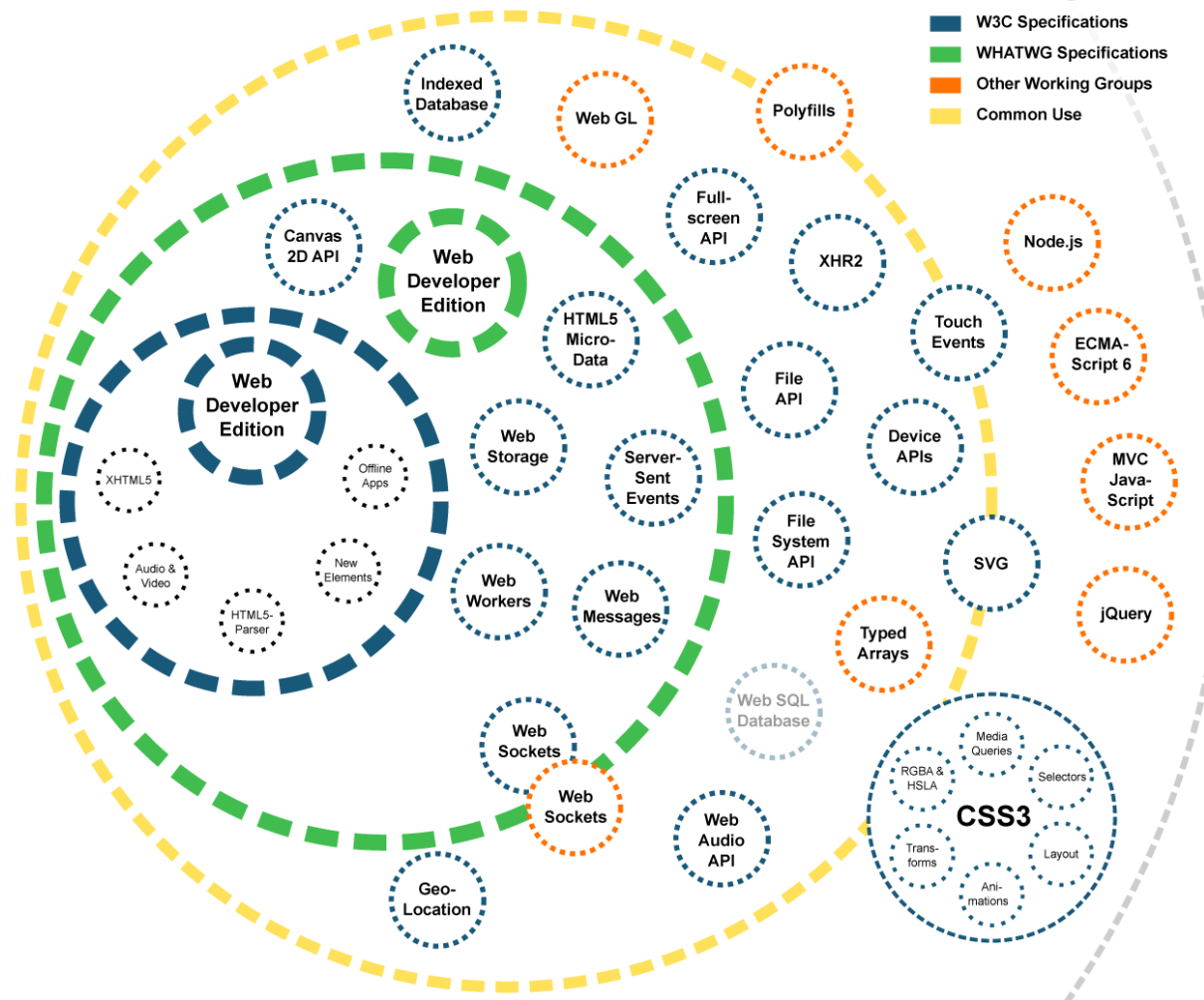
Live Standard: Browser Compatibility?

- 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:
  - 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)

```html
<!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/
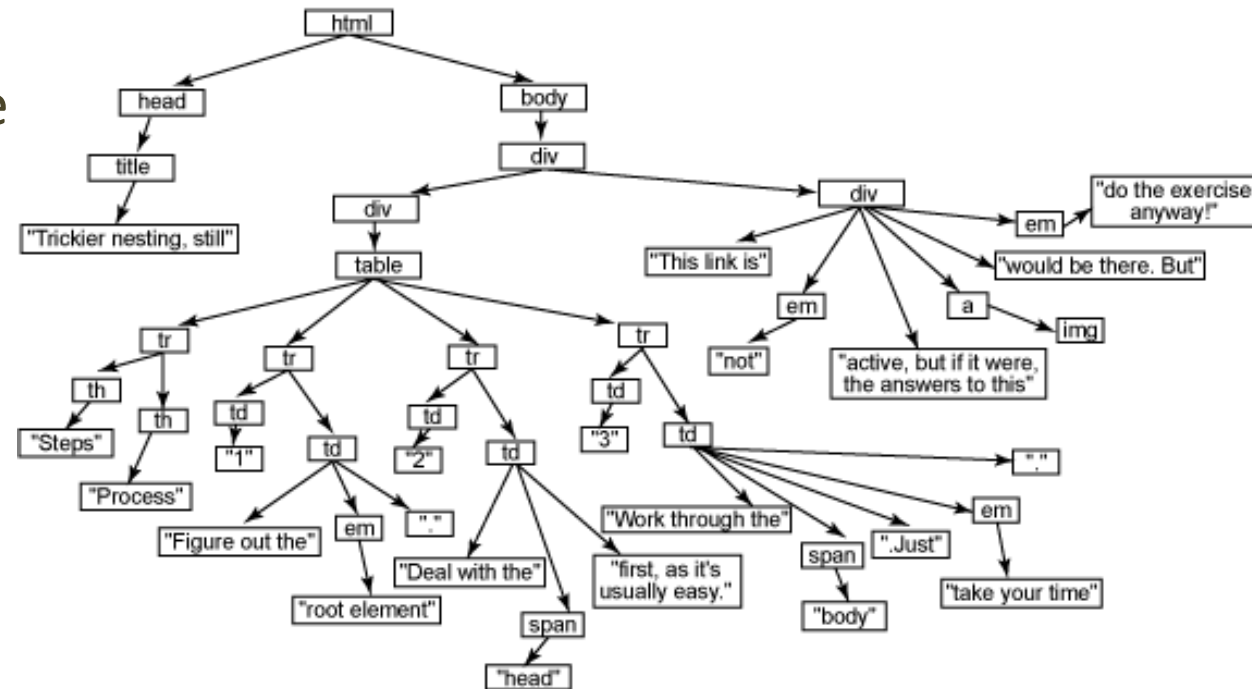
HTML Parsing Into a DOM Tree

```
<!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>
```
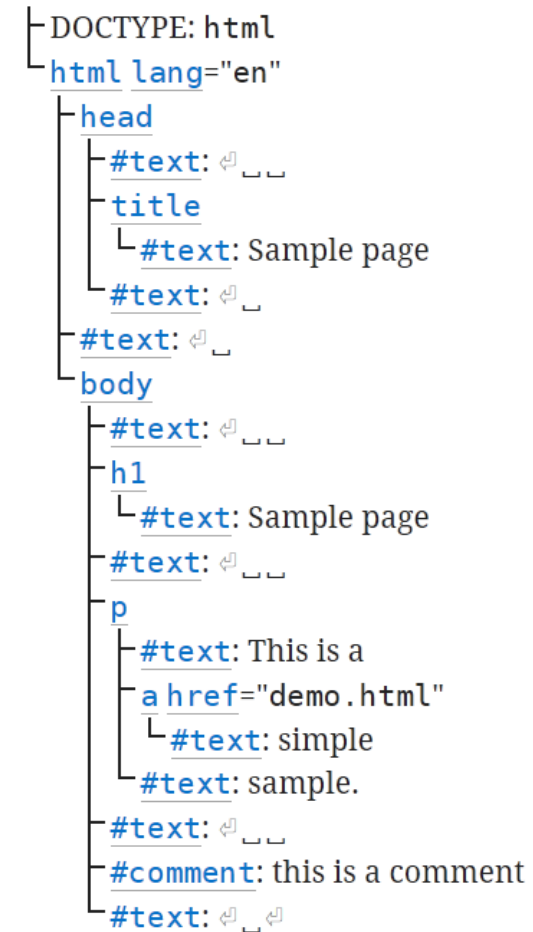
Parsing →

```
├─ DOCTYPE: html
└─ html lang="en"
   ├─ head
   │  ├─ #text: ↵␣␣
   │  ├─ title
   │  │  └─ #text: Sample page
   │  └─ #text: ↵␣
   ├─ #text: ↵␣
   └─ body
      ├─ #text: ↵␣␣
      ├─ h1
      │  └─ #text: Sample page
      ├─ #text: ↵␣␣
      ├─ p
      │  ├─ #text: This is a
      │  ├─ a href="demo.html"
      │  │  └─ #text: simple
      │  └─ #text: sample.
      ├─ #text: ↵␣␣
      ├─ #comment: this is a comment
      └─ #text: ↵␣↵
```

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
  - <u>No HTML code should deal with presentation issues</u>

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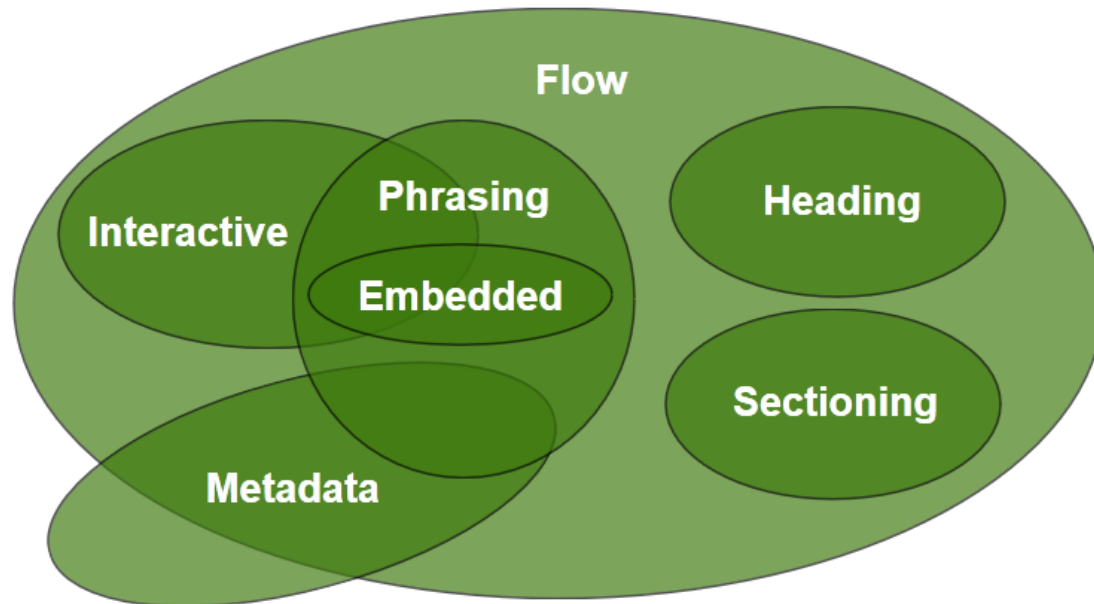
- *Sectioning* content defines headings and footers
- *Heading content* defines the header of a section
- *Phrasing* content is the *text* of the document, as well as elements that mark up that text *at the intra-paragraph level*.
  - Runs of phrasing content form paragraphs.
- *Flow* content includes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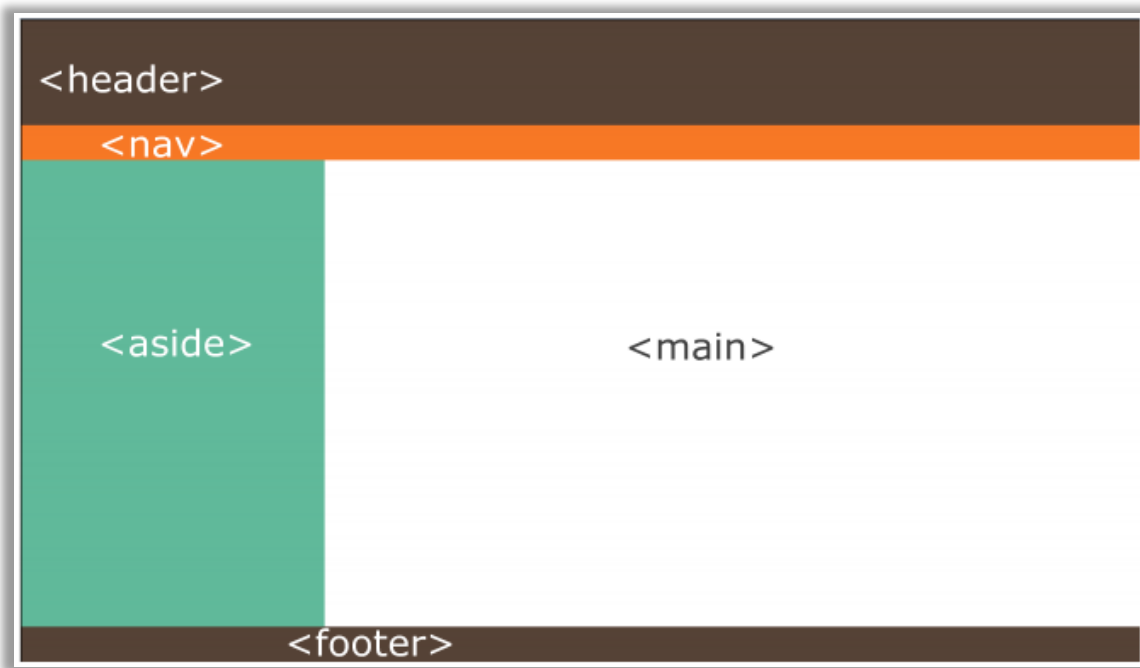

```
1   <body>
2       <header>
3           <nav>
4
5           </nav>
6       </header>
7       <aside>
8
9       </aside>
10      <main>
11
12      </main>
13      <footer>
14
15      </footer>
16  </body>
```

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
`<ol>`	a list of items, where the items have been intentionally ordered. The items of the list are elements
`<ul>`	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
`<div>`	the <div> 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`
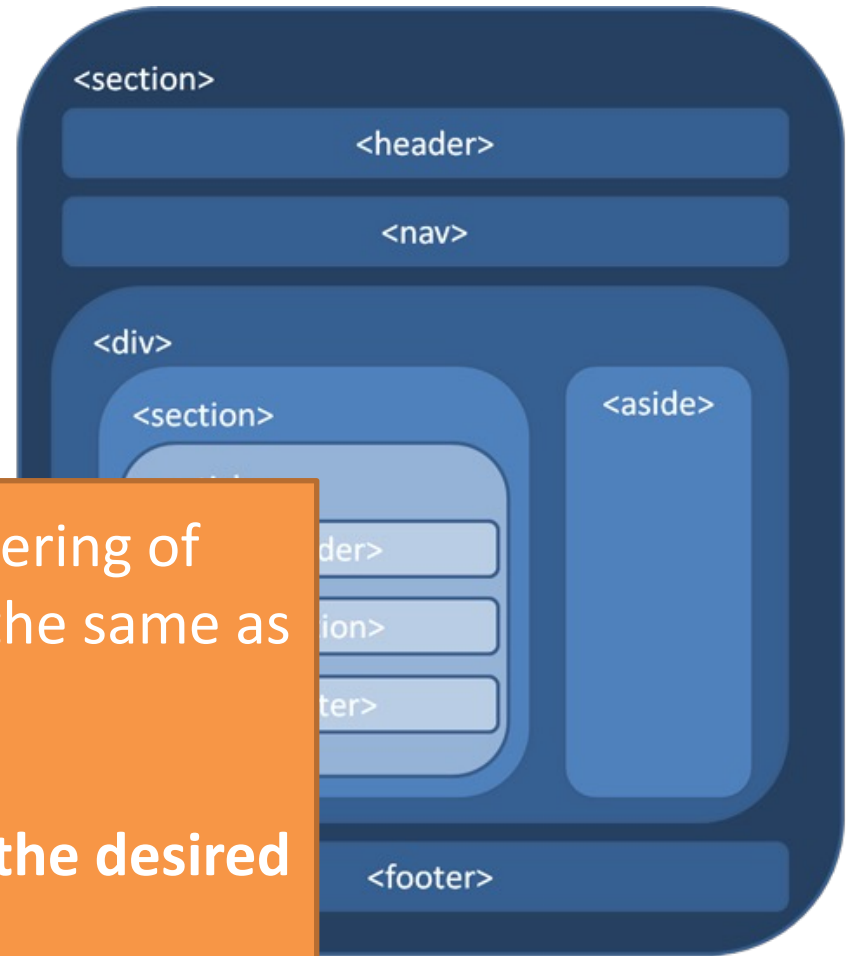
"Wildcard" Elements

<div>...</div>

- 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
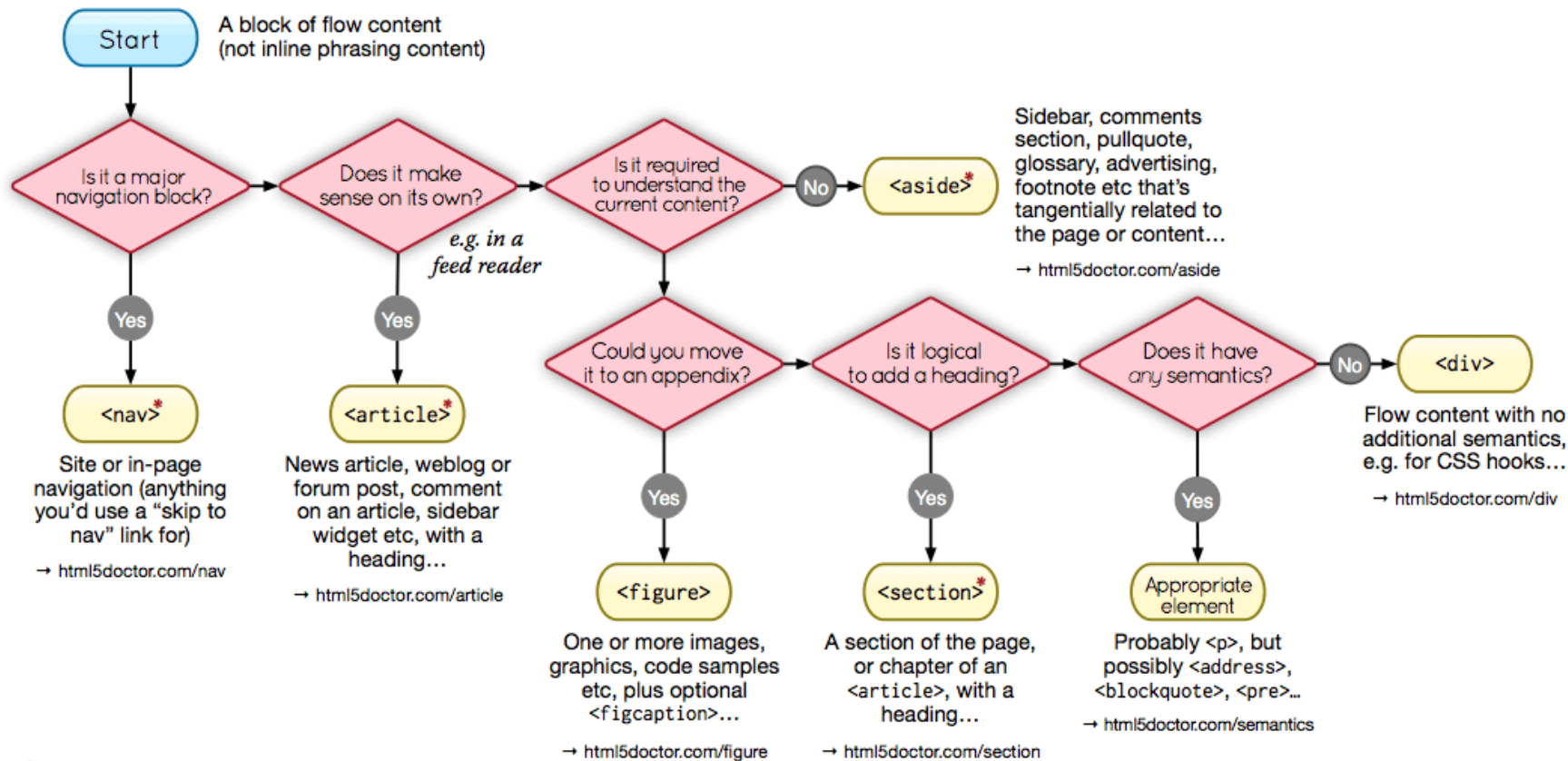
Opaque vs. Semantic elements

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

Only CSS rules will apply the desired layout.

html5 Doctor

HTML5 Element Flowchart
Sectioning content elements and friends

By @riddle & @boblet
www.html5doctor.com

Start

A block of flow content
(not inline phrasing content)

Is it a major navigation block? — **Yes** →
<nav>*
Site or in-page navigation (anything you'd use a "skip to nav" link for)
→ html5doctor.com/nav

Does it make sense on its own? — **Yes** →
e.g. in a feed reader
<article>*
News article, weblog or forum post, comment on an article, sidebar widget etc, with a heading…
→ html5doctor.com/article

Is it required to understand the current content? — **No** →
<aside>*
Sidebar, comments section, pullquote, glossary, advertising, footnote etc that's tangentially related to the page or content…
→ html5doctor.com/aside

Could you move it to an appendix? — **Yes** →
<figure>
One or more images, graphics, code samples etc, plus optional <figcaption>…
→ html5doctor.com/figure

Is it logical to add a heading? — **Yes** →
<section>*
A section of the page, or chapter of an <article>, with a heading…
→ html5doctor.com/section

Does it have any semantics? — **No** →
<div>
Flow content with no additional semantics, e.g. for CSS hooks…
→ html5doctor.com/div

— **Yes** →
Appropriate element
Probably <p>, but possibly <address>, <blockquote>, <pre>…
→ html5doctor.com/semantics

***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

WHAT *Beautiful* HTML LOOKS LIKE

HTML5 and it's new elements make for the most beautiful HTML yet.

DOCTYPE
HTML5 has the best DOCTYPE ever.

TITLE
Title of the site is simple and clean. Purpose of page is first, a separator is used, and ends with title of the site.

CSS
Only one single stylesheet is used (media types are declared inside stylesheet), and only served to good browsers. IE 6 is served a universal stylesheet. Below IE 6 gets nothing.

BODY
ID applied to body to allow for unique page styling without any additional markup.

DESCRIPTIVE BLOCKS
header, section, article, aside... all appropriately describe the content they contain better than the divs of old.

HEIRARCHY
Title tags are reserved for real content, and follow a clear hierarchy.

IMAGE ATTRIBUTES
Images include alternate text, mostly for visually impaired uses but also for validation. Height and width applied for rendering efficiency.

APPROPRIATE TAGS
Lists are marked up as lists, depending on the needs of the list: unordered, ordered, and the underused definition list.

SEMANTIC CLASSES
Beyond appropriate element names, classes and IDs are semantic: they describe without specifying. (e.g. "col" is much better than "left")

CLASSES
Are used any time similar styling needs to be applied to multiple elements (reusability).

IDS
Are used any time an element appears only once on the page and cannot be targeted reasonably any other way.

JAVASCRIPT
jQuery (the most beautiful JavaScript library) is served from Google. Only a single JavaScript file is loaded. Both scripts are referenced at the bottom of the page.

INDENTATION
Tabs or spaces are used to indent the code to properly indicate parent-child relationship of tags.

FILE PATHS
Site resources use relative file paths for efficiency. Content file paths are absolute, assuming content is syndicated.

INCLUDES
Things common across multiple pages are inserted via server side includes. Doesn't have to be PHP of course, any type of include is fine.

CHARACTERS ENCODED
If it's a special character, it's encoded.

DYNAMIC
Things that need to be dynamic, are dynamic.

COMMENTS
Comments are included for things that may not be immediately obvious upon reviewing the code.

FREE FROM STYLING
Nothing on the page applies styling or even implies what the styling might be. Everything on the page is either a required site resource, content, or describing

VALID
The markup adheres to W3C validation. Tags are closed, required attributes used, etc.

beatiful-code.html

```html
<!DOCTYPE HTML>
<html>

<head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />

    <title>Portfolio | Chris Coyier</title>

<!--[if !IE]><!-->
    <link rel="stylesheet" type="text/css" href="/css/main.css" />
<!--<![endif]-->

<!--[if gte IE 7]>
    <link rel="stylesheet" type="text/css" href="/css/main.css" media="screen, projection" />
<![endif]-->

<!--[if IE 6]>
    <link rel="stylesheet" type="text/css" href="http://universal-ie6-css.googlecode.com/files/ie6.0.3.css" media="screen, projection" />
<![endif]-->
</head>

<body id="home">

    <header>
        <a id="logo" href="/">Site Title</a>
        <div id="slogan">web craftsman, blogger, author, speaker</div>

        <nav>
            <?php include("inc/main-menu.php"); ?>
        </nav>
    </header>

    <section class="container">

        <article>
            <h1>Hipsters</h1>

            <img src="http://chriscoyier.net/images/hipster.jpg" alt="Hipster and Company" height="120" width="570" />

            <p>You can&#8217;t dress up as a hipster for Halloween. Their attire is already so bizarre that there isn&#8217;t an
            exaggeration of it that looks like a costume. It would just look like you are another hipster about to read a poem about reading poems.</p>

            <h2>Secondary Title</h2>
            <p>Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.</p>
        </article>

        <article>
            <!-- Additional Article -->
        </article>

    </section>

    <aside>
        <h3>My Major Projects</h3>
        <dl>
            <dt><a href="http://aremysitesup.com">Are My Sites Up?</a></dt>
            <dd>Monitor your sites</dd>

            <dt><a href="http://css-tricks.com">CSS-Tricks</a></dt>
            <dd>A web design community</dd>

            <dt><a href="http://digwp.com">Digging Into WordPress</a></dt>
            <dd>Learn about WordPress</dd>
        </dl>
    </aside>

    <footer class="container">
        <h4>People I Enjoy</h4>
        <ul class="col">
            <li><a href="http://fastfoodreviewed.com">Jesse Lynch</a></li>
            <li><a href="http://jeffcampana.com">Jeff Campana</a></li>
            <li><a href="http://perishablepress.com">Jeff Starr</a></li>
        </ul>
        <ul class="col">
            <li><a href="http://davidwalsh.name">David Walsh</a></li>
            <li><a href="http://thestrategicretreat.com">Jeff Penman</a></li>
            <li><a href="http://http://shiftedfrequency.com">Richard Felix Jr.</a></li>
        </ul>

        <h4>Sandwiches</h4>
        <ul class="col container" id="sandwich-list">
            <li><a href="http://jimmyjohns.com">Jimmy Johns</a></li>
            <li><a href="http://subway.com">Subway</a></li>
            <li><a href="http://potbelly.com">Potbelly</a></li>
        </ul>

        &copy;2007-<?php echo date("Y"); ?> Chris Coyier
    </footer>

<script type="text/javascript" src='http://ajax.googleapis.com/ajax/libs/jquery/1.3.2/jquery.min.js?ver=1.3.2'></script>
<script type='text/javascript' src='/js/main.js'></script>

<!-- Google Analytics Code -->
<?php include_once("inc/analytics.php"); ?>

</body>

</html>
```

Line: 10   Column: 69   HTML   Tab Size: 3

02/10/22

https://css-tricks.com/what-beautiful-html-code-looks-like/

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/

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