



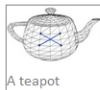
The
University
Of
Sheffield.

Team X

[Home](#) [News](#) [Fixtures](#) [About us](#)

Welcome

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COM1008:

Web and Internet Technology

Lecture 3: HTML and CSS

Dr Steve Maddock

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1. Introduction

- When creating a web page, separate the structure and appearance
 - HTML – structure (first)
 - CSS – appearance (second)
- Today
 - Design of a website for Team X
 - Grouping of elements
 - Fonts
 - Spacing – the box model



Welcome

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut

2. Structure

- The site will have 4 pages

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut

News

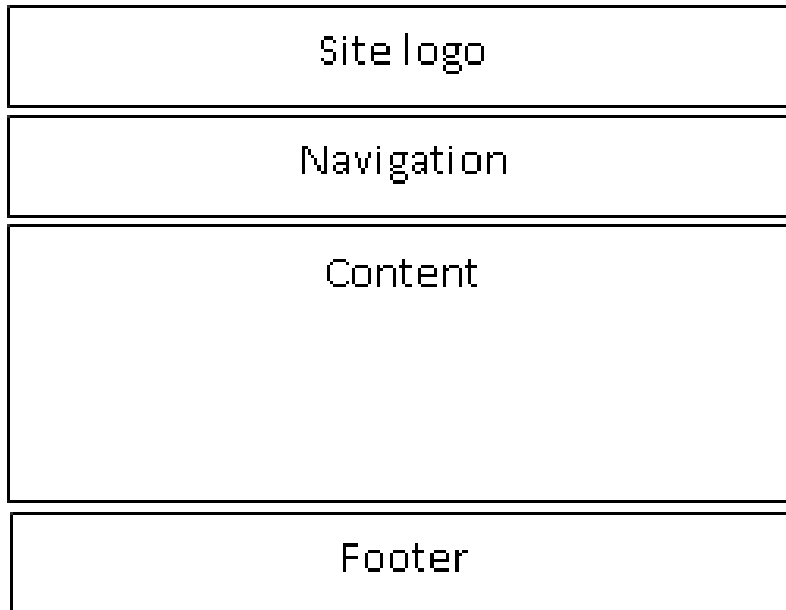
Fixtures

About us

voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

2. Structure

- Each page is structured into four separate areas
- Elements are grouped into each of these areas



```
<!DOCTYPE html>
<html lang="en">

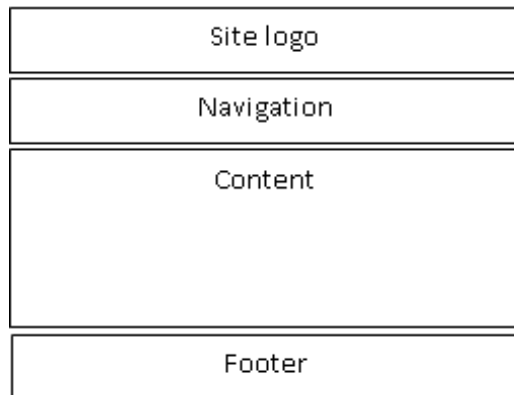
<head>
  <meta charset="utf-8" />
  <title>Team X</title>
</head>

<body>
  <!-- site logo -->
  <!-- navigation -->
  <!-- main content area -->
  <!-- footer -->
</body>

</html>
```

2. Structure

- The block elements start a new line when they are displayed



Team X

- Home
- News
- Fixtures
- About us

Welcome

some text

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```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li>Home</li>
    <li>News</li>
    <li>Fixtures</li>
    <li>About us</li>
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

2. Structure

- Create the navigation links

Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li><a href="index.html">Home</a></li>
    <li><a href="news.html">News</a></li>
    <li><a href="fixtures.html">Fixtures</a></li>
    <li><a href="aboutus.html">About us</a></li>
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

2. Structure

- Each file has the same navigation links

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>
```

index.html

```
<!-- navigation -->
<ul>
  <li><a href="index.html">Home</a></li>
  <li><a href="news.html">News</a></li>
  <li><a href="fixtures.html">Fixtures</a></li>
  <li><a href="aboutus.html">About us</a></li>
</ul>
```

```
<body>
  <!-- si
  <h1>Te news.html

  <!-- navigation -->
  <ul>
    <li><a href="index.html">Home
    <li><a href="news.html">News
    <li><a href="fixtures.html">
    <li><a href="aboutus.html">A
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

```
<body>
  <!--
  <h1>T fixtures.html

  <!-- navigation -->
  <ul>
    <li><a href="index.html">Home
    <li><a href="news.html">News<
    <li><a href="fixtures.html">F
    <li><a href="aboutus.html">Ab
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

```
<body>
  <!-- site logo -->
  <h1>Team X</h1> aboutus.html

  <!-- navigation -->
  <ul>
    <li><a href="index.html">Home</a></li>
    <li><a href="news.html">News</a></li>
    <li><a href="fixtures.html">Fixtures</a></li>
    <li><a href="aboutus.html">About us</a></li>
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

3. Grouping elements

- Some elements naturally group things
 - E.g. The semantics of p and ul are understood
 - The html5 semantic elements (which we'll see in the next lecture)
- Some elements can be used to identify parts of the document when no other element is suitable:
 - The span element – an inline element
 - The div element – a block element

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li>Home</li>
    <li>News</li>
    <li>Fixtures</li>
    <li>About us</li>
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```


3.1 span

- Used for grouping an inline portion of the document

```
<p>  
The quick <span class="highlight">brown fox</span> jumped  
over the lazy dog.  
</p>
```

```
*.highlight{  
    color: brown;  
}
```

3.2 div

- Used for grouping block elements

```
<body>
  <!-- site logo -->
  <!-- navigation -->

  <!-- main content area -->
  <div id="maincontent">
    <h1>Welcome</h1>
    <p>some text</p>
  </div>

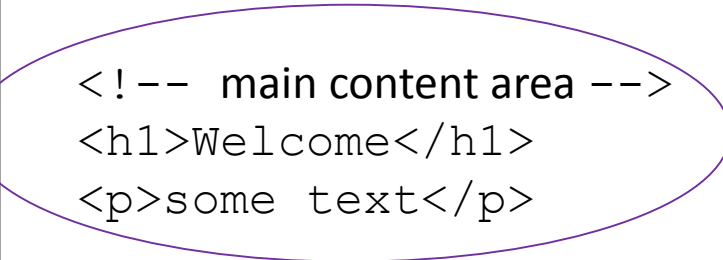
  <!-- footer -->
</body>
```

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li>Home</li>
    <li>News</li>
    <li>Fixtures</li>
    <li>About us</li>
  </ul>

  <!-- main content area -->
  <h1>Welcome</h1>
  <p>some text</p>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```



4. Appearance

- We use CSS to change appearance
- Example: Change the style of h1 elements
 - Purple
 - Arial font

```
h1 {  
  color: purple;  
  font-family: Arial, sans-serif;  
}
```

Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

5. Computer fonts

- A computer font is “a scalable set of digital shapes that may be printed at many different sizes” [http://en.wikipedia.org/wiki/Computer_font]
- Example attributes: font-family, font-size, font-style, font-weight

Team X

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- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

```
h1 {  
    color: purple;  
    font-family: Arial, sans-serif;  
    font-size: 130%;  
}  
  
p, ul {  
    font-family: Calibri, sans-serif;  
}
```

5.1 font-family [<http://www.w3.org/TR/CSS21/fonts.html>]

'font-family'

<i>Value:</i>	<code>[[<family-name> <generic-family>] [, <family-name> <generic-family>]*] inherit</code>
<i>Initial:</i>	depends on user agent
<i>Applies to:</i>	all elements
<i>Inherited:</i>	yes
<i>Percentages:</i>	N/A

Always include a generic family in the list of fallback fonts

```
h1 {  
  font-family: "Lucida Handwriting", Papyrus, serif;  
}
```



<generic-family>

In the example above, the last value is a generic family name.

- 'serif' (e.g., Times)
- 'sans-serif' (e.g., Helvetica)
- 'cursive' (e.g., Zapf-Chancery)
- 'fantasy' (e.g., Western)
- 'monospace' (e.g., Courier)

5.2 Generic families

Proportional fonts



Serif

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Georgia

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Times New Roman

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Verdana

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Arial



Sans serif

Mono-spaced fonts

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Andale Mono

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Courier

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Brush Script

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890
The quick brown fox jumps over the lazy dog

Comic Sans

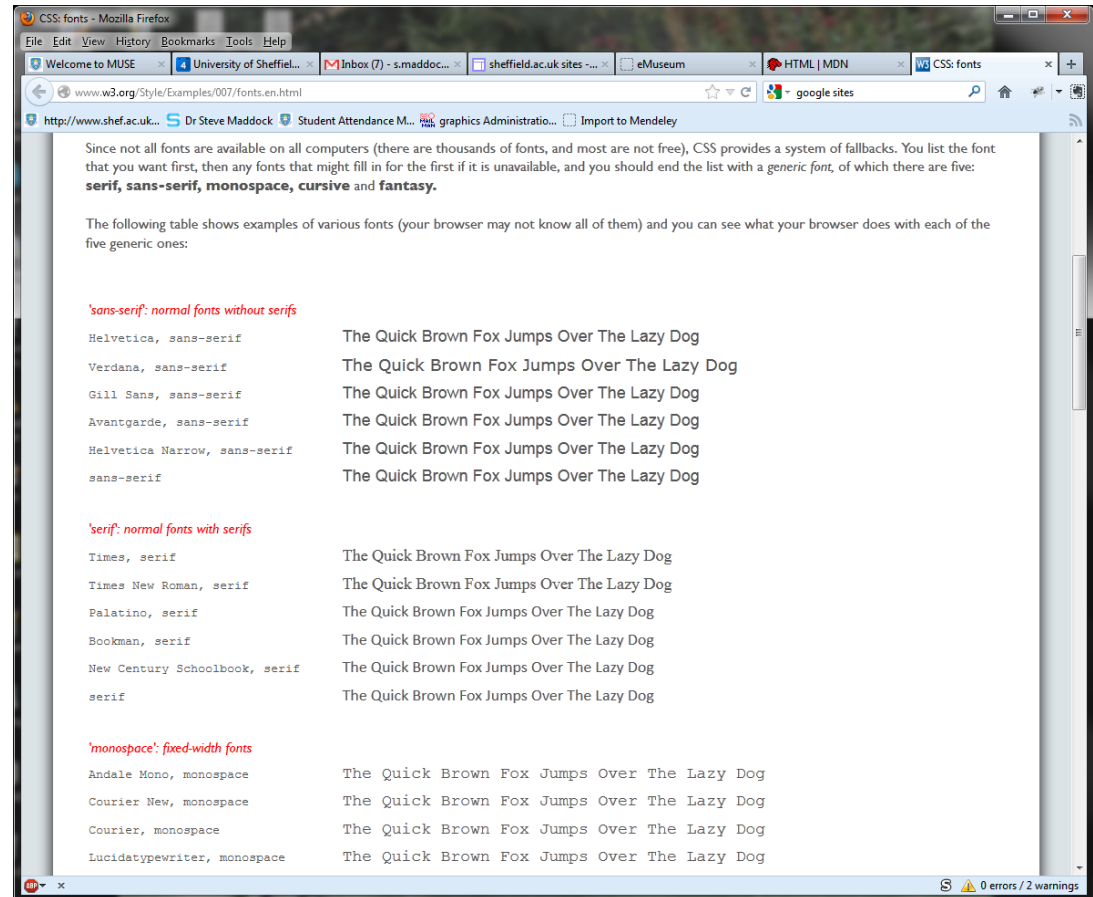
Cursive font

Display fonts

Fantasy font

5.3 Available fonts

- Not all fonts are available on all browser/computer combinations



<http://www.w3.org/Style/Examples/007/fonts.en.html>

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

5.4 Web fonts

- Use @font-face to download remote fonts
- Add the definition to the CSS file
 - Font Squirrel (<http://www.fontsquirrel.com/>) can be used to create cross-browser CSS code

```
/* Generated by Font Squirrel (http://www.fontsquirrel.com/) */
```

```
@font-face {  
    font-family: '1942_report1942_report';  
    src: url('1942-webfont.eot');  
    src: url('1942-webfont.eot?#iefix') format('embedded-opentype'),  
        url('1942-webfont.woff') format('woff'),  
        url('1942-webfont.ttf') format('truetype'),  
        url('1942-webfont.svg#1942_report1942_report') format('svg');  
    font-weight: normal;  
    font-style: normal;  
}
```

```
h1 { font-family: "1942_report1942_report"; }
```


6. Length units for the Web

1. Absolute units: pt, mm, cm, in, pc (1pc = 12pt; 72pt = 1in)
 - Use only if you know physical properties of output medium
2. The pixel unit: px
 - `body { padding: 40px; }`
3. Relative units: em (Usual default for a web page is 16px = 1em)
 - The height of the font relative to parent font size.
 - `h1 { font-size: 1.35em; }`
 - With rem, size is relative to root element's size (i.e. size of <html>)
4. Percentages – relative to parent
 - `h1 { font-size: 135%; }`

7. Specific styles

- Styling the headings
 - Main heading for site logo: Papyrus
 - Heading in main content area: Arial
- Ordering of rules matters
 - ‘Last one wins’
- **Problem:** Conflicting requirements
- Need a way to treat each h1 separately

```
h1 {  
  color: purple;  
  font-family: Papyrus, serif;  
  font-size: 200%;  
}  
  
h1 {  
  color: purple;  
  font-family: Arial, sans-serif;  
  font-size: 130%;  
}
```



Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

7.1 Specific styles – solutions

- Give an id or a class to the specific h1 element

```
<!-- site logo -->  
<h1 id="mainheading">Team X</h1>
```

```
#mainheading {  
    color: purple;  
    font-family: Papyrus, serif;  
    font-size: 200%;  
}  
  
h1 {  
    color: purple;  
    font-family: Arial, sans-serif;  
    font-size: 130%;  
}
```

Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

some text

copyright, year

- **Alternative:** use a CSS contextual selector

7.2 Contextual selector

- **E F** means F is a descendant of E
- **E>F** means F is a child of E
- **E+F** means F is immediately preceded by E (i.e. sibling)

```
h1 {
  color: purple;
  font-family: Papyrus, serif;
  font-size: 200%;
}

#maincontent h1 {
  color: purple;
  font-family: Arial, sans-serif;
  font-size: 130%;
}
```

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li>Home</li>
    <li>News</li>
    <li>Fixtures</li>
    <li>About us</li>
  </ul>

  <!-- main content area -->
  <div id="maincontent">
    <h1>Welcome</h1>
    <p>some text</p>
  </div>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

7.3 Rule ordering

- Only set color once rather than in each rule
- Take advantage of ‘cascading’ and ‘inheritance’
- The CSS selector `h1` is the style for all `h1` elements

```
h1 {  
    color: purple;  
    font-family: Papyrus, serif;  
    font-size: 200%;  
}  
  
#maincontent h1 {  
    color: purple;  
    font-family: Arial, sans-serif;  
    font-size: 130%;  
}
```

- `#maincontent h1` is more *specific*
- We have been doing this already by assuming default styles for the browser

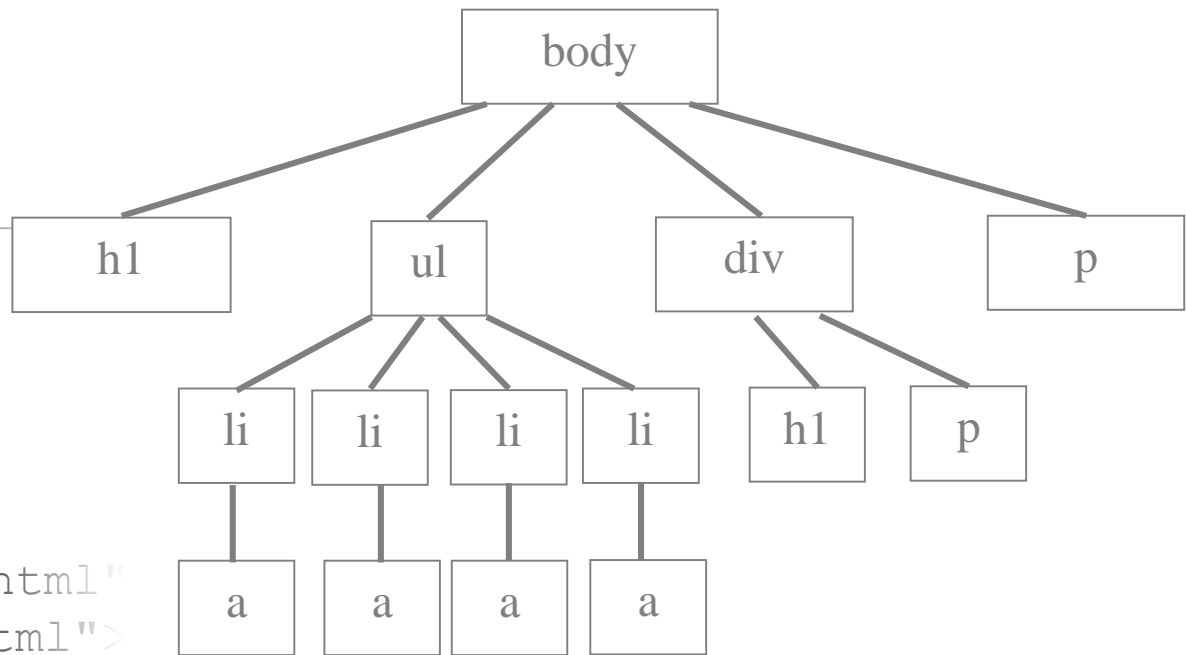
8. Inheritance

```
<body>
  <!-- site logo -->
  <h1>Team X</h1>

  <!-- navigation -->
  <ul>
    <li><a href="index.html">
    <li><a href="news.html">
    <li><a href="fixtures.ht
    <li><a href="aboutus.htm
  </ul>

  <!-- main content area -->
  <div id="maincontent">
    <h1>Welcome</h1>
    <p>some text</p>
  </div>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```



“Some values are inherited by the children of an element in the document tree”
<http://www.w3.org/TR/CSS2/cascade.html>

Properties that are inherited:
<http://www.w3.org/TR/CSS21/propidx.htm>
|

8. Inheritance

```
<body>
  <!-- site logo -->
  <h1 id="mainheading">Team X</h1>
  <!-- navigation -->
  <ul>
    <li><a href="index.html">Home</a></li>
    <li><a href="news.html">News</a></li>
    <li><a href="fixtures.html">Fixtures</a></li>
    <li><a href="aboutus.html">About us</a></li>
  </ul>

  <!-- main content area -->
  <div id="maincontent">
    <h1>Welcome</h1>
    <p>some text</p>
  </div>

  <!-- footer -->
  <p>copyright, year</p>
</body>
```

Extra id introduced
for next example

8. Inheritance

- body selector's text colour and font-family will be 'inherited' by children
- General style for all h1 elements (h1 are children of body)
 - override color and font-size
 - inherit font-family
- h1.mainheading is specific and overrides the font-family and font-size attributes
- #maincontent h1 is specific and overrides font-family

```
body {
    color: gray;
    font-family: Calibri,
                sans-serif;
}

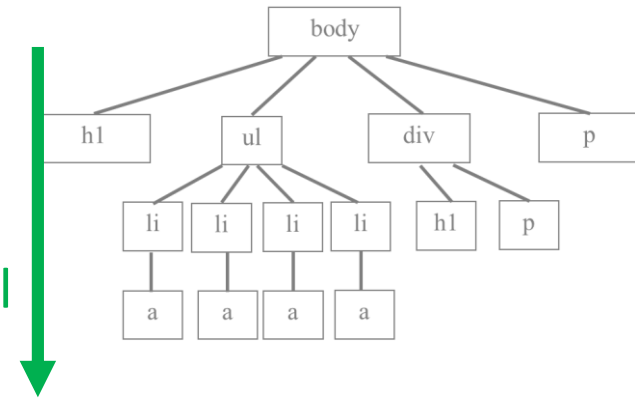
h1 {
    color: purple;
    font-size: 130%;
}

#mainheading {
    font-family: Papyrus,
                serif;
    font-size: 200%;
}

#maincontent h1 {
    font-family: Arial,
                sans-serif;
}
```


9. Cascading

- Cascading is horizontal, inheritance is vertical



- Cascade: browser's default → user styles → designer's style
- Cascade: external style sheets → embedded styles → inline styles
 - (external/embedded priority depends on order – see next rule)
- Cascade: last one in multiple rules of same 'specificity'

External style sheet

```
body {  
  color: gray;  
  font-family: serif;  
}
```

Embedded

```
<head> ...  
  <link rel="stylesheet" href="teamx1.css" />  
  <style>  
    body { color: blue; }  
  </style>  
</head>
```

10. Specificity

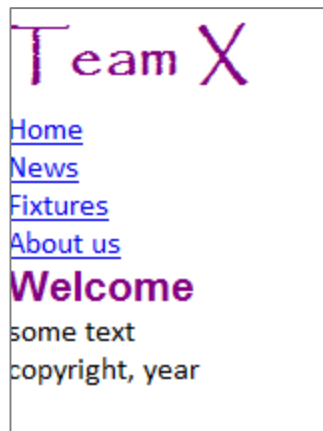
CSS rule	specificity
p	1 (1 HTML selector)
div p	2 (2 HTML selectors; 1+1)
.tree	10 (1 class selector)
div p.tree	12 (2 HTML selectors and a class selector; 1+1+10)
#baobab	100 (1 id selector)
body #content .alternative p	112 (HTML selector, id selector, class selector, HTML selector; 1+100+10+1)

- If all of these examples were used,
 - `div p.tree` (specificity 12) would win out over `div p` (specificity 2)
 - `body #content .alternative p` would win out over all of them, *regardless of the order* in the css file

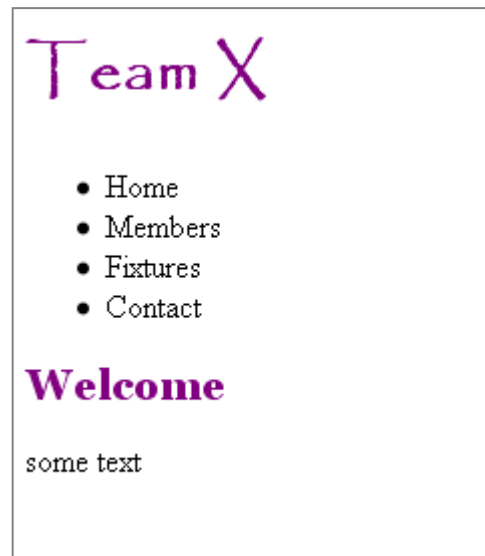
Example from <http://www.htmldog.com/guides/cssadvanced/specificity/>

11. Spacing

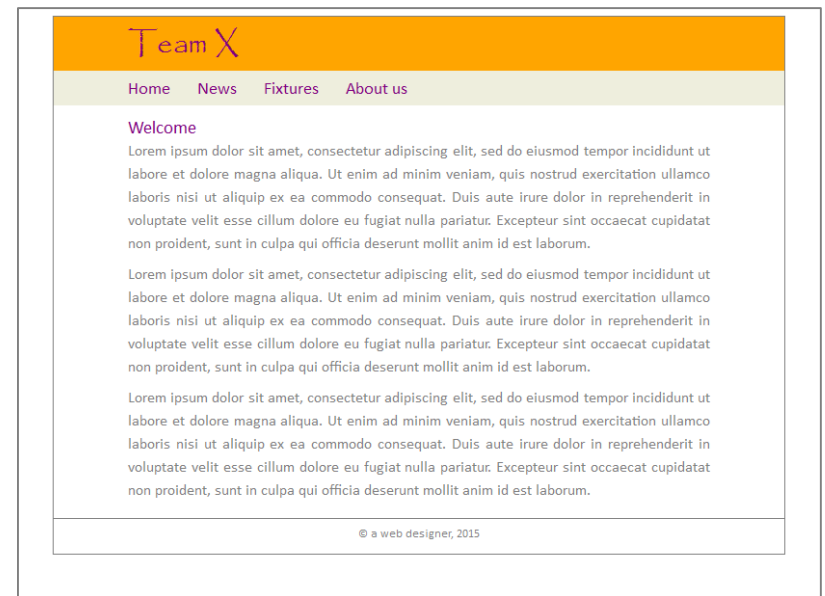
- How do we change the spacing around elements on the page?



No spacing



Default



Controlled spacing

Welcome

My 11.1 The Box Model

have been involved in projects in modelling and animating faces, although I have also worked on visualisation and computer games over the last 20 years or so. I am Head of the Computer Graphics and Virtual Reality Research Group. I have over 60 refereed publications and am a member of both ACM SIGGRAPH and Eurographics. I also have a keen interest in the use of virtual reality in education.

- Every element (content) is placed inside a box

Selected papers

- Each box region may have a thickness of zero
- Warburton, A., S. Maddock, D. Romano (2009) "Opportunities and Challenges", Special Reports & Studies Series at the Research & Studies Center (Dubai Police Academy), 2009

- BinSubain, A., S. Maddock, D. Romano (2009) "Accurate Multi-Dimensional Poisson-Disc Sampling", ACM Transactions on Graphics, 28(3), October 2009, 1-11
- Gamito, M.N. and S.C. Maddock (2009) "Based approach to Visual Speech for a Mexican-Spanish Talking Head", International Journal of Computer Games Technology, Volume 2009 (2009), article 1542056, 7 pages

- Martinez Lazalde, O., S. Maddock, M. Meredith (2008), "A Based approach to Visual Speech for a Mexican-Spanish Talking Head", International Journal of Computer Games Technology, Volume 2008 (2008), article 1542056, 7 pages

- Martinez Lazalde, O., S. Maddock, M. Meredith (2008), "A Based approach to Visual Speech for a Mexican-Spanish Talking Head", International Journal of Computer Games Technology, Volume 2008 (2008), article 1542056, 7 pages

Recent funded projects

- Physically-based facial modelling and animation (production), EPSRC Upgrading Small Scale Equipment Base for Early Career Researchers, £2,570, Viceconti (PI) et al inc. Maddock, 1 Nov 2012 - 31 March 2013

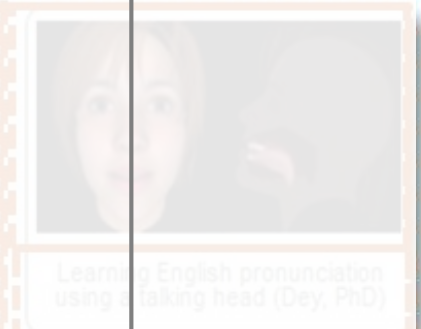
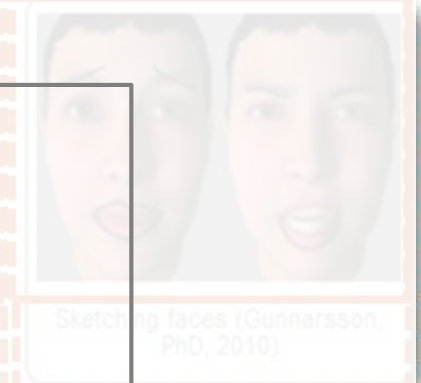
- Computer Love (virtual gallery), University of Sheffield Festival of the Mind, £3,522, Brown and Maddock (Computer Science), Bax (Humanstudio), 20-30 Sep 2012

- RECITE (Rethinking a City's Theatres, Digital Creativity and Innovation), University of Sheffield Cross-cutting Director of Research and Innovation Scholarships in the Digital World, £162,000, Peng (PI) and Samuel (Architecture), Maddock and Romano (Computer Science), Nicholson and Babbage (English), Sep 2010-Sep 2013

- "Visual Speech for Technology Enhanced Learning", ESRC/EPORC PhD studentship, £49,000, Maddock (PI, Computer Science), Nicholson (Psychology), Pascalis (Grenoble), Oct 2008-Sep 2011, PhD student: Brive Dey

05/10/2015

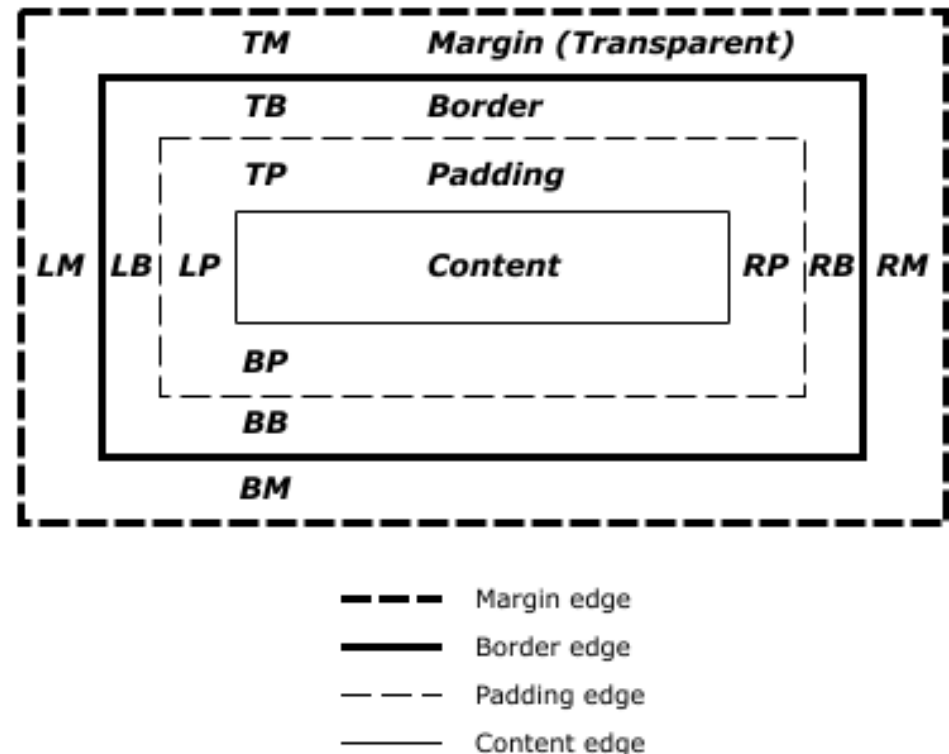
© Dr Steve Maddock, The University of Sheffield



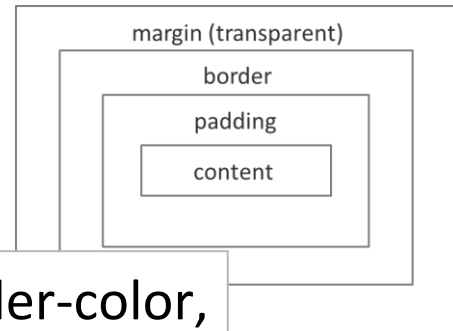
11.2 Margin, border, padding

- Margins are transparent
- Padding
 - Same appearance as the content's background
- Border
 - Finite thickness around the padding and contents
- The content element also has width and height attributes

<http://www.w3.org/TR/CSS2/box.html>



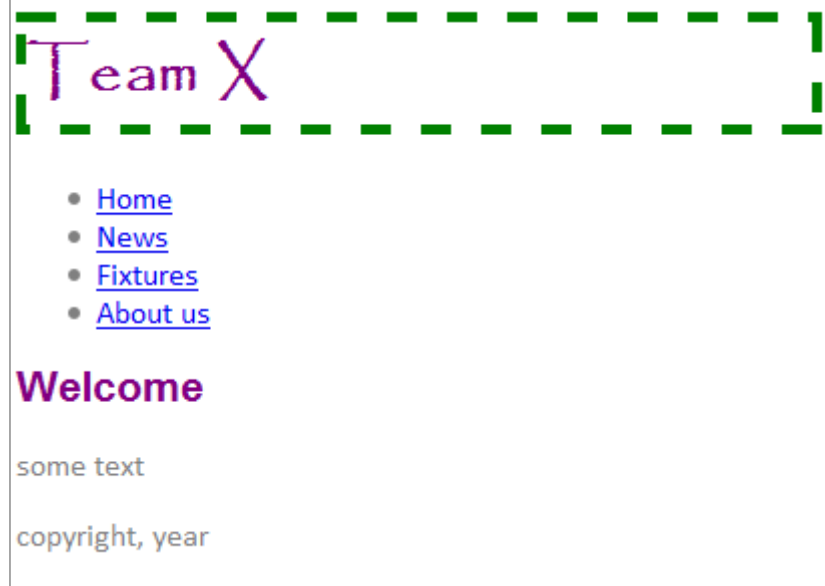
Total width = margin-left + border-left-width + padding-left
+ 'content element width'
+ padding-right + border-right-width + margin-right



11.3 Example: borders

- Properties: border, border-width, border-style, border-color, border-top-width, border-right-width, ...
- border-width: <length> | thin | medium | thick
- border-style: none | hidden | dotted | dashed ...

```
#mainheading {  
  border: 5px dashed green;  
  font-family: Papyrus, serif;  
  font-size: 200%;  
}
```

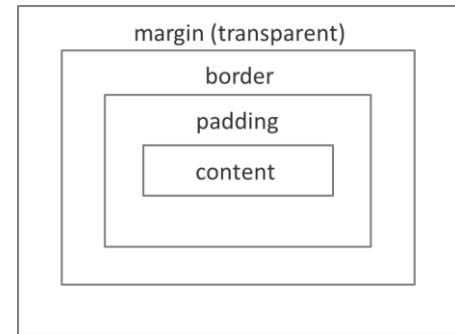


<https://developer.mozilla.org/en/docs/Web/CSS/border>

11.4 Margins

- Properties: margin, margin-top, margin-right, margin-bottom, margin-left
 - *length* | *percentage* | auto

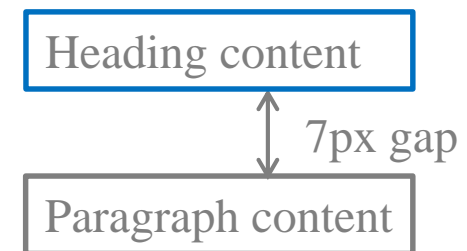
```
body {  
  margin: 50px;  
  border: 1px solid orange;  
  padding: 10px;  
  color: gray;  
  font-family: Calibri, sans-serif;  
}
```



11.5 Collapsing margins

- Browsers will automatically ‘collapse’ adjoining margins
- *Example:* consider two boxes one immediately above the other:
 - Upper box has margin-bottom of 4px
 - Lower box has margin-top of 7px
 - The resulting margin between the boxes is 7px, not 11px
- Doesn't apply to certain kinds of elements
 - e.g. floated elements, inline elements, absolutely positioned elements

```
h1 {  
  margin: 0 0 4px 0;  
  border 1px solid blue;  
}  
  
p {  
  margin: 7px 0 0 0;  
  border 1px solid gray;  
}
```



h1#mainheading 742 × 61

Team X

- [Home](#)
- [News](#)
- [Fixtures](#)
- [About us](#)

Welcome

12. Debugging

- Firefox Web Developer tools

Examine the h1 element in the site logo area.
Reveals a top and bottom margin of 21.433 pixels.

Inspector Console Debugger Style Editor Performance Network

html > body > h1#mainheading

```
<!DOCTYPE html>
<html lang="en">
  <head></head>
  <body>
    <!-- site logo -->
    <h1 id="mainheading">Team X</h1>
```

Rules Computed Fonts Box Model Animations

742×61

margin 21.4333

border 5

padding 0

margin-top 0

732×51

0 5 0 0 5 0

0

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13. Summary

- When creating a Web page, separate the structure (**HTML**) and the appearance (**CSS**)
- The hierarchical structure of a document can be visualised as a set of nested boxes – the box model
 - The **box model** is used to control spacing around elements
- The **div** and **span** elements can be used to identify parts of the document when no other element is suitable
- CSS rules can proliferate, so need to organise and work out which apply – **cascading, inheritance and specificity**
- *Next lecture:* HTML5 semantic elements, tables, some practicalities

Appendix A. Tables

- How to create the following table?

	Estimate	Measured	Error
Height (cm)	40	43	+3
Width (cm)	26	25	-1

Table 1. Widget production error

- Steps:
 - The whole table
 - A row
 - A cell
 - A heading cell
 - A caption

	Estimate	Measured	Error
Height (cm)	40	43	+3
Width (cm)	26	25	-1

Table 1. Widget production error

Appendix A. Tables

- The whole table
- A row
- A cell
- A heading cell
- A caption

table1.css

```
caption {  
  caption-side: bottom;  
}
```

- See:
<http://www.w3.org/TR/CSS2/tables.html>

```
<table>  
  <caption>Table 1. Widget  
production data</caption>  
  <tr>  
    <td></td>  
    <th>Estimate</th>  
    <th>Measured</th>  
    <th>Error</th>  
  </tr>  
  <tr>  
    <th>Height (cm)</th>  
    <td>40</td>  
    <td>43</td>  
    <td>+3</td>  
  </tr>  
  <tr>  
    <th>Width (cm)</th>  
    <td>26</td>  
    <td>25</td>  
    <td>-1</td>  
  </tr>  
</table>
```

Appendix B. pseudo-classes

[<http://www.w3.org/TR/selectors/>]

- “Keyword added to a selector that specifies a special state of the element to be selected” [<https://developer.mozilla.org/en-US/docs/Web/CSS/Pseudo-classes>]
 - E.g. has a link been visited before? is the mouse currently hovering over a link?

```
a:link { color: purple; }  
a:visited { color: purple; }  
a:hover { color: white; }  
p:hover { color: red; }
```

```
<ul>  
  <li><a href="index.html">Home</a></li>  
  <li><a href="news.html">News</a></li>  
  <li><a href="fixtures.html">Fixtures</a></li>  
  <li><a href="aboutus.html">About us</a></li>  
</ul>
```

- nth-child(an+b)

tr:nth-child(2n+1)

Represents the odd rows of an HTML table.

[nice example at: <https://developer.mozilla.org/en-US/docs/Web/CSS/%3Anth-child>]