



**AUSTRALIAN MATHS TRUST**

# Web Design

Workbook



```
<!DOCTYPE html>
<html>
  <head>
    <title>digIT Workshop</title>
  </head>
  <body>
    <h1 style="text-align: center; font-family: serif;">
```

# Building Websites with HTML and CSS

```
    </h1>
  </body>
</html>
```

## HTML and CSS: An Overview

**H**yper**T**ext **M**arkup **L**anguage (HTML) is an XML-based language that provides the **structure** of a web page by “marking up” the content with **tags**. These tags label elements in the page as headings, paragraphs, images, lists and many other types that add structure to content. The HTML standard has undergone several revisions since the first one was released (and is constantly being updated and extended) – the language we will look at in these workshops is HTML 5, released in 2014.

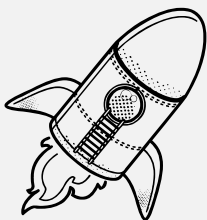


**C**ascading **S**tyle **S**heets (CSS) is a language used to describe the **presentation** of XML-based documents, most often used for HTML pages. This can include visual properties like layout, colour and fonts, different layouts for different screen sizes and types, and the presentation of pages in different media (for example, text-to-speech). Each version of CSS has been built on the previous version – we will look at CSS 3.



HTML is used for *content*. CSS is used for *presentation*. In a perfect world, our HTML pages convey *document structure and meaning* while our visual design is defined entirely by CSS. Why?

- **Visual accessibility** – users can load their own stylesheets
- **Flexibility** – responsive design
- **Reusability** – external stylesheets
- Can you think of other reasons? (Hint: look up “separation of presentation and content”!)



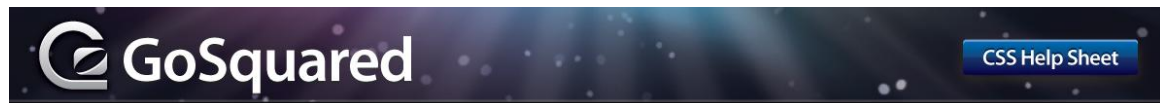
*Coding in HTML and CSS probably isn't “computer programming” as you traditionally think of it, but it can be a complex and rewarding pursuit that adds an extra layer to your backend development – as well as incredibly frustrating when you're trying to get every element to sit perfectly in place!*

# HTML Cheatsheet

HTML5 NEW TAG	HTML5 TAG CHEAT SHEET	Created by WebsiteSetup.org
<b>TAG NOT SUPPORTED IN HTML 5</b>		
<b>&lt;!----&gt;</b> Define a comment	<b>&lt;ins&gt;</b> Defines inserted text	<b>&lt;s&gt;, &lt;strike&gt;</b> Used to define strikethrough text.
<b>&lt;!DOCTYPE&gt;</b> Defines the document type	<b>&lt;keygen&gt;</b> Defines a generated key in a form	<b>&lt;rp&gt;</b> Used in ruby annotations to define what to show browsers that do not support the ruby element
<b>&lt;a&gt;</b> href, hreflang, media, ping, rel, target, type	<b>&lt;kbd&gt;</b> Defines keyboard text	<b>&lt;rt&gt;</b> Defines explanation to ruby annotations
<b>&lt;abbr&gt;</b> Defines an abbreviation	<b>&lt;label&gt;</b> Defines an inline sub window for, form	<b>&lt;ruby&gt;</b> Defines ruby annotations
<b>&lt;acronym&gt;</b> Used to define an embedded acronym	<b>&lt;legend&gt;</b> Defines a title in a fieldset	<b>&lt;u&gt;</b> Used to define underlined text
<b>&lt;address&gt;</b> Defines an address element	<b>&lt;li&gt;</b> Defines a list item value	<b>&lt;ul&gt;</b> Defines an unordered list
<b>&lt;applet&gt;</b> Used to define an embedded applet	<b>&lt;link&gt;</b> Defines a resource reference	<b>&lt;var&gt;</b> Defines a variable
<b>&lt;area&gt;</b> Defines an area inside an image map alt, coords, href, hreflang, media, ping, rel, shape, target, type	<b>&lt;map&gt;</b> Defines an image map name	<b>&lt;video&gt;</b> Defines a video autobuffer, autoplay, controls, height, loop, src, width
<b>&lt;article&gt;</b> Defines an article cite, pubdate	<b>&lt;mark&gt;</b> Defines marked text	
<b>&lt;aside&gt;</b> Defines content aside from the page content	<b>&lt;menu&gt;</b> Defines a menu list label, type	
<b>&lt;audio&gt;</b> Defines sound content autobuffer, autoplay, controls, src	<b>&lt;meta&gt;</b> Defines meta information charset, content, http-equiv, name	
<b>&lt;b&gt;</b> Defines bold text	<b>&lt;meter&gt;</b> Defines measurement within a predefined range high, low, max, min, optimum, value	
<b>&lt;base&gt;</b> Defines a base URL for all the links in a page href, target	<b>&lt;nav&gt;</b> Defines navigation links	
<b>&lt;basefont&gt;</b> Used to define a default font-color, font-size, or font-family for all the document	<b>&lt;noframes&gt;</b> Used to display text for browsers that do not handle frames	
<b>&lt;bdo&gt;</b> Defines the direction of text display	<b>&lt;noscript&gt;</b> Defines an noscript section	
<b>&lt;big&gt;</b> Used to make text bigger	<b>&lt;object&gt;</b> Defines an embedded object data, form, height, name, type, usemap, width	
<b>&lt;blockquote&gt;</b> Defines a long quotation cite	<b>&lt;ol&gt;</b> Defines an ordered list reversed, start	
<b>&lt;body&gt;</b> Defines the body element	<b>&lt;optgroup&gt;</b> Defines an option group label, disabled	
<b>&lt;br&gt;</b> Inserts a single line break	<b>&lt;option&gt;</b> Defines an option in a drop-down list disabled, label, selected, value	
<b>&lt;button&gt;</b> Defines a push button autofocus, disabled, form, formaction, formenctype, formmethod, formnovalidate, formtarget, name, type, value	<b>&lt;output&gt;</b> Defines some types of output for, form, name	
<b>&lt;canvas&gt;</b> Defines graphics height, width	<b>&lt;p&gt;</b> Defines a paragraph	
<b>&lt;caption&gt;</b> Defines a table caption	<b>&lt;param&gt;</b> Defines a parameter for an object name, value	
<b>&lt;center&gt;</b> Used to center-align text and content	<b>&lt;pre&gt;</b> Defines preformatted text	
<b>&lt;cite&gt;</b> Defines a citation	<b>&lt;progress&gt;</b> Defines progress of a task of any kind max, value	
<b>&lt;code&gt;</b> Defines computer code text autobuffer, autoplay, controls, src	<b>&lt;q&gt;</b> Defines a short quotation cite	
<b>&lt;col&gt;</b> Defines attributes for table columns	<b>&lt;rp&gt;</b> Used in ruby annotations to define what to show browsers that do not support the ruby element	
<b>&lt;colgroup&gt;</b> Defines groups of table columns span	<b>&lt;rt&gt;</b> Defines explanation to ruby annotations	
<b>&lt;command&gt;</b> Defines a command button checked, disabled, icon, label, radiogroup, type	<b>&lt;ruby&gt;</b> Defines ruby annotations	
	<b>&lt;u&gt;</b> Used to define underlined text	
	<b>&lt;ul&gt;</b> Defines an unordered list	
	<b>&lt;var&gt;</b> Defines a variable	
	<b>&lt;video&gt;</b> Defines a video autobuffer, autoplay, controls, height, loop, src, width	
	<b>&lt;td&gt;</b> Defines a table cell colspan, headers, rowspan, scope	
	<b>&lt;thead&gt;</b> Defines a table header colspan, headers, rowspan, scope	
	<b>&lt;th&gt;</b> Defines a table header colspan, headers, rowspan, scope	
	<b>&lt;time&gt;</b> Defines a date/time datetime	
	<b>&lt;title&gt;</b> Defines the document title	
	<b>&lt;tr&gt;</b> Defines a table row	
	<b>&lt;tt&gt;</b> Used to define teletype text	
	<b>&lt;u&gt;</b> Used to define underlined text	
	<b>&lt;ul&gt;</b> Defines an unordered list	
	<b>&lt;var&gt;</b> Defines a variable	
	<b>&lt;video&gt;</b> Defines a video autobuffer, autoplay, controls, height, loop, src, width	

Source: <https://websitesetup.org/html5-cheat-sheet/>

# CSS Cheatsheet



Syntax	Margins + Padding	Shorthand
<b>Write styles for any element</b> selector {property: value;}		<b>Comments</b> /* Comments */
<b>External Style Sheet</b> <pre>&lt;link rel="stylesheet" type="text/css" href="style.css" /&gt;</pre>		<b>Background</b> <b>background-color</b> Colour of background <b>background-image</b> Background image url("") <b>background-repeat</b> repeat, no-repeat, repeat-x, repeat-y <b>background-attachment</b> Background image scrolls with element scroll, fixed <b>background-position</b> (x y), top, center, bottom, left, right
<b>Internal Style</b> <pre>&lt;style type="text/css"&gt; selector {property: value} &lt;/style&gt;</pre>	<b>Border</b> <b>border-width</b> Width of the border <b>border-style</b> dashed; dotted; double; groove; inset; outset; ridge; solid; none; <b>border-color</b> Colour of the border	<b>Media Types</b> all braille embossed handheld print projection screen speech tty tv
<b>Inline Style</b> <pre>&lt;tag style="property: value"&gt;</pre>	<b>Position</b> <b>clear</b> If any floating elements around the element both, left, right, none <b>float</b> Floats to a specified side left, right, none <b>left</b> The left position of an element auto, length values [pt, in, cm, px] <b>top</b> The top position of an element auto, length values [pt, in, cm, px] <b>position</b> static, relative, absolute <b>z-index</b> Above or below overlapping elements auto, integer [higher numbers on top]	<b>Keywords</b> Developing for IE6 is a lost cause.
<b>General</b> <b>class</b> String preceded by a full stop (.) <b>ID</b> String preceded by a hash (#) <b>div</b> Formats structure or block of text <b>span</b> Inline formatting <b>color</b> Foreground colour <b>cursor</b> Appearance of the cursor <b>display</b> block; inline; list-item; none <b>overflow</b> How to handle content that overflows its box. visible; hidden; scroll; auto <b>visibility</b> visible; hidden	<b>Position</b> <b>clear</b> If any floating elements around the element both, left, right, none <b>float</b> Floats to a specified side left, right, none <b>left</b> The left position of an element auto, length values [pt, in, cm, px] <b>top</b> The top position of an element auto, length values [pt, in, cm, px] <b>position</b> static, relative, absolute <b>z-index</b> Above or below overlapping elements auto, integer [higher numbers on top]	<b>Keywords</b> Developing for IE6 is a lost cause.
<b>Font</b> <b>font-style</b> italic, normal <b>font-variant</b> normal, small-caps <b>font-weight</b> bold, normal, lighter, bolder, integer [100-900] <b>font-size</b> Size of the font <b>font-family</b> Specific font[s] to be used.	<b>Background</b> <b>background-color</b> Colour of background <b>background-image</b> Background image url("") <b>background-repeat</b> repeat, no-repeat, repeat-x, repeat-y <b>background-attachment</b> Background image scrolls with element scroll, fixed <b>background-position</b> (x y), top, center, bottom, left, right	<b>Keywords</b> Developing for IE6 is a lost cause.
<b>Text</b> <b>letter-spacing</b> Space between letters <b>line-height</b> Vertical space between baselines <b>text-align</b> Horizontal alignment <b>text-decoration</b> blink, line-through, none, overline, underline <b>text-indent</b> First line indentation <b>text-transform</b> capitalise, lowercase, uppercase <b>vertical-align</b> Vertical alignment <b>word-spacing</b> Spacing between words	<b>Border</b> <b>border-width</b> Width of the border <b>border-style</b> dashed; dotted; double; groove; inset; outset; ridge; solid; none; <b>border-color</b> Colour of the border	<b>Keywords</b> Developing for IE6 is a lost cause.
	<b>Margins + Padding</b> height; width; margin-top; margin-right; margin-bottom; margin-left; padding-top; padding-right; padding-bottom; padding-left;	<b>Keywords</b> Developing for IE6 is a lost cause.
	<b>Shorthand</b> background border border-bottom border-left border-right border-top font list-style margin padding	<b>Keywords</b> Developing for IE6 is a lost cause.



Download this Help Sheet now at [gosquared.com/liquidicity](http://gosquared.com/liquidicity)

Original by the awesome Leslie Frank: <http://lesliefranke.com/2005/10/css-cheat-sheet/>

Put it on your wall

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## Advanced Workshop Activity: Your own website

In the advanced workshop, you'll have free reign to create and design your own website with help from the tutors. Create your content locally, then use the information on the next page to upload your new site to the web and show it off to your friends!

### Tips to make your life easier...

- Remember to give your HTML files “.html” or “.htm” extensions, and your CSS files “.css” extensions!
- Name your main/home page “index.html” or “index.htm” in your root directory to ensure it's the default page for new visitors to your website.
- Using relative links and references to files within your website structure ensures that they won't break if you later rehost your content at a different web address. Remember to use forward slashes (“/”) when referencing files in different folders, not backslashes like in Windows (“\”).
- Separating your stylesheets from your HTML files will make it a whole lot easier to change the look and feel of your website later!
- Just like on your home computer, it's much easier to keep track of all your files and images if you keep a neat directory structure on your webspace. Best practices: don't use spaces in file or folder names, and organise non-HTML files into folders by type (eg. images, css).



*Not sure what to put on your site? Here are some ideas:*

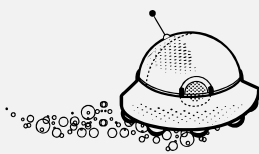
- ❖ *Create a site about one of your interests or hobbies*
- ❖ *Set up your own blog, designed from scratch*
- ❖ *Design a gallery site for photos you've taken or images you like*
- ❖ *Redesign the CSS Zen Garden (see page 7)*
- ❖ *Create an online resume for yourself*

**REMEMBER!** *Content on the web is public and anyone with the link can see it, so think twice and check with your parents before posting any personally identifying information on your website!*

## Uploading to the Internet

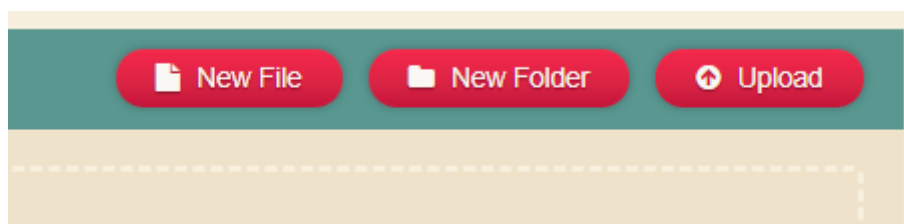
Neocities is a completely free web host where anyone can create a site and make it available to the world. We're going to use Neocities to upload and host our files.

- Sign up to Neocities at [neocities.org](https://neocities.org). Your website address is public, so you might not want to use your full name – maybe use your first name and last initial instead, or something describing what your site is about.
- Once you've signed up, picked the free plan and confirmed your email address, head to the dashboard at <https://neocities.org/dashboard>
- Feel free to delete the starter files Neocities gives you – you have your own content to upload!



*Remember to follow common sense about what you upload to your website! It's public, so don't share anything you wouldn't want other people to see.*

Uploading files is super easy with Neocities – just drag and drop them from your desktop or Windows Explorer over the top of the Neocities window, or click the red “Upload” button to pick a file from your computer:



Make sure you upload all the files you need – don't forget your CSS files! You can create and edit new files right in your browser with the “New File” button and built-in editor too, so you can work on your website from anywhere.

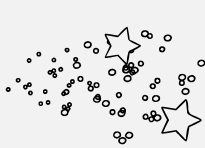
Access your website at [yourname.neocities.org](https://yourname.neocities.org)! Share this address with family and friends to show them what you've been doing at Summer School!

## Advanced Workshop Activity: CSS in the Garden

As part of or in addition to making your own website, take a stroll in the CSS Zen Garden: [www.csszengarden.com](http://www.csszengarden.com)

Every design featured in the Zen Garden uses exactly the same HTML – only the CSS is different! It's a beautiful and varied display of the design possibilities using CSS as well as a fantastic example of the concept of *separation of presentation and content*. While the Garden is no longer being updated, it remains online to inspire and challenge web designers.

Once you've finished the Grok course on HTML and CSS, it's time to put what you've learned to the test. Download the example HTML file from CSS Zen Garden (and, if you choose, an example CSS file – but you might want to start from scratch) and try some of your new techniques to style a page without changing the HTML. This is just like the *inTRIPid* activity at the end of your Grok course – but now you have the freedom to design however you want!



Feel free to restyle the *inTRIPid* page instead, or cook up something of your own!

### Where might I start?

- Try floating some divs in different ways and see how they move around or how you can position them
- Change some colours or find some images you like online and use them in the design
- Pick some Zen Garden stylesheets you like, download their source code and copy some properties or look them up in the online CSS reference. Try to figure out *what* they're doing and *how*!



## Where do I go from here?

### Make a backend

At this camp you've learnt some Python skills, so why not combine those with your new frontend HTML/CSS knowledge and build a backend for a website? A framework like **Django** or **web2py** lets you build dynamic websites rapidly without having to learn database query languages. Try the tutorials! (Note that you won't be able to run these on Neocities, but you can set it up to work on your home computer and buy a plan from a fully-featured web host like VentraIP [www.ventraip.com.au](http://www.ventraip.com.au) when you're ready to go live!)

- [www.djangoproject.com](http://www.djangoproject.com)
- [www.web2py.com](http://www.web2py.com)



### Seek external validation

It's always good to check your code for unintended errors – this will make it more likely to display the same way in different browsers, and it's just good coding practice! Luckily, the W3C provides official validators for HTML and CSS (and some other content types too!) that will help you track down errors.

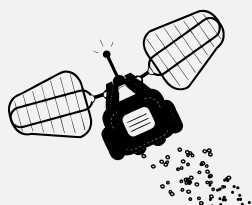
- [validator.w3.org](http://validator.w3.org)
- [jigsaw.w3.org/css-validator/](http://jigsaw.w3.org/css-validator/)

### Add interactivity with JavaScript

JavaScript code will run right in your browser and, while it's not limited to use in websites, you can attach it to your HTML elements to have your page interact with the user. There are plenty of guides online - try the tutorial at [htmldog.com/guides/javascript/](http://htmldog.com/guides/javascript/). We'll check out JavaScript at winter camp.

### Extra references

- [dev.w3.org/html5/html-author/](http://dev.w3.org/html5/html-author/) - official HTML 5 reference
- [developer.mozilla.org/docs/Web/HTML](http://developer.mozilla.org/docs/Web/HTML) - Mozilla HTML reference/guide
- [developer.mozilla.org/docs/Web/CSS](http://developer.mozilla.org/docs/Web/CSS) - Mozilla CSS reference/guide
- [www.edx.org/school/w3cx](http://www.edx.org/school/w3cx) - Free online HTML and CSS courses from the W3C, the web's international standards organisation



*You can make as many Neocities sites as you like. What can you come up with? You might also like to ask your IT teacher if your school provides space for student websites!*