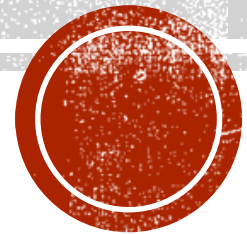


CSS

Web Application Development



SOURCE: W3SCHOOLS

The diagram illustrates the navigation path from the W3Schools homepage to the CSS Tutorial page. It consists of two browser window screenshots connected by a large orange arrow pointing from left to right.

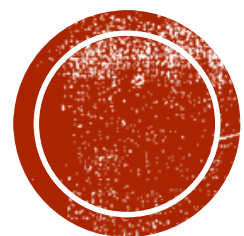
Left Browser Window (Homepage):

- Address bar: <https://www.w3schools.com>
- Logo: w3schools.com
- Navigation bar: TUTORIALS ▼ REFERENCES ▼
- Dropdown menu (under TUTORIALS):
 - HTML and CSS
 - Learn HTML
 - Learn CSS (highlighted)
 - Learn W3.CSS
 - Learn Colors
 - Learn Bootstrap 3
 - Learn Bootstrap 4
 - Learn Icons
 - Learn Graphics

Right Browser Window (CSS Tutorial Page):

- Address bar: <https://www.w3schools.com/css/default.asp>
- Logo: w3schools.com
- Navigation bar: Home HTML CSS (highlighted) JAVASCRIPT SQL PHP BOOTSTRAP HOW TO
- Left sidebar (CSS Tutorial):
 - CSS Tutorial
 - CSS HOME (highlighted)
 - CSS Introduction
 - CSS Syntax
 - CSS How To
 - CSS Colors
 - CSS Backgrounds
 - CSS Borders
 - CSS Margins
- Main content area:
 - Section: CSS Tutorial
 - Link: < Home
 - Text: CSS is a language that describes the style of an HT...
 - Text: CSS describes how HTML elements should be displa...





CSS INTRODUCTION

Web Application Development

CSS INTRODUCTION

What is CSS?

- **CSS** stands for **Cascading Style Sheets**
- CSS describes **how HTML elements are to be displayed on screen, paper, or in other media**
- CSS **saves a lot of work**. It can control the layout of multiple web pages all at once
- External stylesheets are stored in **CSS files**

CSS INTRODUCTION

CSS Demo - One HTML Page - Multiple Styles!

Here we will show one HTML page displayed with four different stylesheets. Try it out at:
https://www.w3schools.com/Css/css_intro.asp

Welcome to My Homepage
Use the menu to select different Stylesheets

Stylesheet 1

Stylesheet 2

Stylesheet 3

Stylesheet 4

No Stylesheet

Same Page Different Stylesheets

This is a demonstration of how different stylesheets can change the layout of your HTML page. You can change the layout of this page by selecting different stylesheets in the menu, or by selecting one of the following links:
Stylesheet1, Stylesheet2, Stylesheet3, Stylesheet4.

No Styles

This page uses DIV elements to group different sections of the HTML page. Click here to see how the page looks like with no stylesheet:
No Stylesheet.

Side-Bar

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.

Welcome to My Homepage
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5

CSS INTRODUCTION

Why Use CSS?

CSS is used to define styles for your web pages, including the design, layout and variations in display for different devices and screen sizes.

CSS INTRODUCTION

CSS Solved a Big Problem

HTML was NEVER intended to contain tags for formatting a web page!

HTML was created to **describe the content** of a web page, like:

```
<h1>This is a heading</h1>
```

```
<p>This is a paragraph.</p>
```

When tags like ``, and color attributes were added to the HTML 3.2 specification, it started a nightmare for web developers. Development of large websites, where fonts and color information were added to every single page, became a long and expensive process.

To solve this problem, the World Wide Web Consortium (W3C) created CSS.

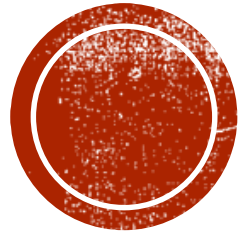
CSS removed the style formatting from the HTML page!

CSS INTRODUCTION

CSS Saves a Lot of Work!

The style definitions are normally saved in external .CSS files.

With an external stylesheet file, you can change the look of an entire website by changing just one file!



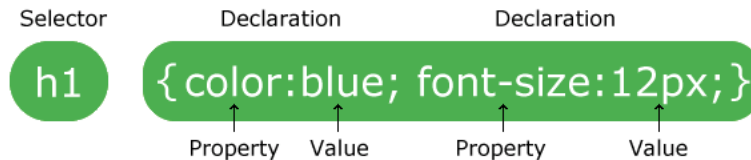
CSS SYNTAX AND SELECTORS

Web Application Development

CSS SYNTAX AND SELECTORS

CSS Syntax

A CSS rule-set consists of a selector and a declaration block:



The selector points to the HTML element you want to style.

The declaration block contains one or more declarations separated by semicolons.

Each declaration includes a CSS property name and a value, separated by a colon.

A CSS declaration always ends with a semicolon, and declaration blocks are surrounded by curly braces.

In the following example all <p> elements will be center-aligned, with a red text color:

```
p {  
    color: red;  
    text-align: center;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax1

CSS SYNTAX AND SELECTORS

CSS Selectors

CSS selectors are used to "find" (or select) HTML elements based on their element name, id, class, attribute, and more.

- element selector
- id selector
- class Selector

CSS SYNTAX AND SELECTORS

The element Selector

The element selector selects elements based on the element name.

You can select all <p> elements on a page like this (in this case, all <p> elements will be center-aligned, with a red text color):

```
p {  
    text-align: center;  
    color: red;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax_element

CSS SYNTAX AND SELECTORS

The id Selector

The id selector uses the id attribute of an HTML element to select a specific element.

The id of an element should be unique within a page, so the id selector is used to select one unique element!

To select an element with a specific id, write a hash (#) character, followed by the id of the element.

The style rule below will be applied to the HTML element with id="para1":

```
#para1 {  
    text-align: center;  
    color: red;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax_id

Note: An id name cannot start with a number!

CSS SYNTAX AND SELECTORS

The class Selector

The class selector selects elements with a specific class attribute.

To select elements with a specific class, write a period (.) character, followed by the name of the class.

In the example below, all HTML elements with class="center" will be red and center-aligned:

```
.center {  
    text-align: center;  
    color: red;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax_class

Note: A class name cannot start with a number!

CSS SYNTAX AND SELECTORS

The class Selector Continued

You can also specify that only specific HTML elements should be affected by a class.

In the example below, only <p> elements with class="center" will be center-aligned:

```
p.center {  
    text-align: center;  
    color: red;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax_element_class

CSS SYNTAX AND SELECTORS

The class Selector Continued

HTML elements can also refer to more than one class.

In the example below, the `<p>` element will be styled according to `class="center"` and to `class="large"`:

```
<p class="center large">This paragraph refers to two classes.</p>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax_element_class2

CSS SYNTAX AND SELECTORS

Grouping Selectors

If you have elements with the same style definitions, like this:

```
h1 {
    text-align: center;
    color: red;
}

h2 {
    text-align: center;
    color: red;
}

p {
    text-align: center;
    color: red;
}
```

It will be better to group the selectors, to minimize the code.

To group selectors, separate each selector with a comma.

In the example below we have grouped the selectors from the code above:

```
h1, h2, p {
    text-align: center;
    color: red;
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_grouping

CSS SYNTAX AND SELECTORS

CSS Comments

Comments are used to explain the code, and may help when you edit the source code at a later date.

Comments are ignored by browsers.

A CSS comment starts with `/*` and ends with `*/`. Comments can also span multiple lines:

```
p {  
    color: red;  
    /* This is a single-line comment */  
    text-align: center;  
}
```

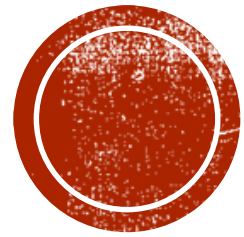
```
/* This is  
a multi-line  
comment */
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_syntax2

CSS SYNTAX AND SELECTORS

Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)



CSS “HOW TO”

Web Application Development

CSS HOW TO

Three Ways to Insert CSS

When a browser reads a style sheet, it will format the HTML document according to the information in the style sheet.

Three Ways to Insert CSS:

1. External style sheet
2. Internal style sheet
3. Inline style attribute-value pair

CSS SYNTAX AND SELECTORS

External Style Sheet

With an external style sheet, you can change the look of an entire website by changing just one file!

Each page must include a reference to the external style sheet file inside the <link> element. The <link> element goes inside the <head> section:

```
<head>  
<link rel="stylesheet" type="text/css" href="mystyle.css">  
</head>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_external

CSS SYNTAX AND SELECTORS

External Style Sheet Continued

An external style sheet can be written in any text editor. The file should not contain any html tags. The style sheet file must be saved with a .css extension.

Here is how the "mystyle.css" looks:

```
body {  
    background-color: lightblue;  
}  
  
h1 {  
    color: navy;  
    margin-left: 20px;  
}
```

Note: Do not add a space between the property value and the unit (such as `margin-left: 20 px`); The correct way is: `margin-left: 20px`;

CSS SYNTAX AND SELECTORS

Internal Style Sheet

An internal style sheet may be used if one single page has a unique style.

Internal styles are defined within the <style> element, inside the <head> section of an HTML page:

```
<head>
<style>
body {
    background-color: linen;
}

h1 {
    color: maroon;
    margin-left: 40px;
}
</style>
</head>
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_internal

CSS SYNTAX AND SELECTORS

Inline Styles

An inline style may be used to apply a unique style for a single element.

To use inline styles, add the style attribute to the relevant element. The style attribute can contain any CSS property.

The example below shows how to change the color and the left margin of a <h1> element:

```
<h1 style="color:blue;margin-left:30px;">This is a heading</h1>
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_inline

Tip: An inline style loses many of the advantages of a style sheet (by mixing content with presentation). Use this method sparingly.

CSS SYNTAX AND SELECTORS

Multiple Style Sheets

If some properties have been defined for the same selector (element) in different style sheets, the value from the last read style sheet will be used.

Assume that an external style sheet has the following style for the `<h1>` element:

```
h1 {
  color: navy;
}
```

then, assume that an internal style sheet also has the following style for the `<h1>` element:

```
h1 {
  color: orange;
}
```

If the internal style is defined after the link to the external style sheet, the `<h1>` elements will be "orange":

```
<head>
<link rel="stylesheet" type="text/css" href="mystyle.css">
<style>
h1 {
  color: orange;
}
</style>
</head>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_multiple

However, if the internal style is defined before the link to the external style sheet, the `<h1>` elements will be "navy":

```
<head>
<style>
h1 {
  color: orange;
}
</style>
<link rel="stylesheet" type="text/css" href="mystyle.css">
</head>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_multiple2

CSS SYNTAX AND SELECTORS

Cascading Order

Specificity
discussed later

What style will be used when there is more than one style specified for an HTML element?

Generally speaking we can say that all the styles will "cascade" into a new "virtual" style sheet by the following rules, where number one has the highest priority:

1. Inline style (inside an HTML element)
2. External and internal style sheets (in the head section)
3. Browser default

So, an inline style (inside a specific HTML element) has the highest priority, which means that it will override a style defined inside the <head> tag, or in an external style sheet, or a browser default value.

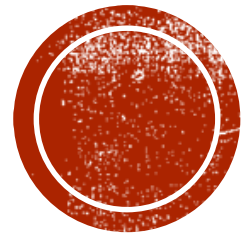
Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_howto_cascade

CSS SYNTAX AND SELECTORS

Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)



CSS COLORS

Web Application Development

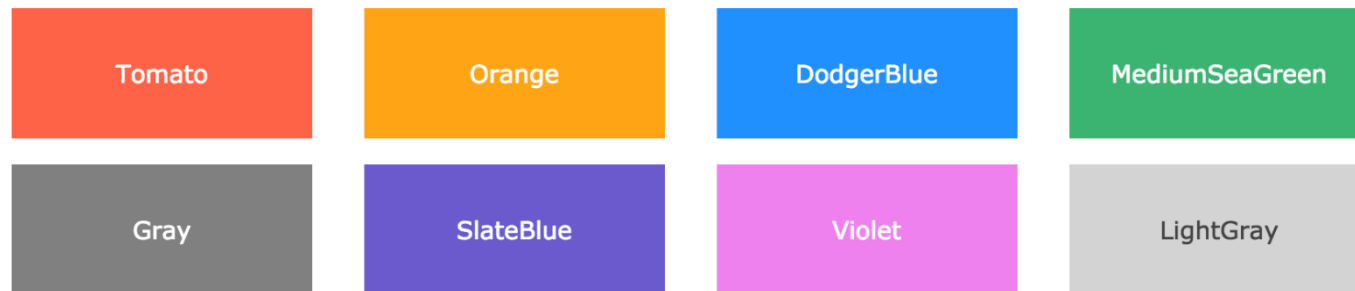
CSS COLORS

Color Names

Colors are specified using predefined color names, or RGB, HEX, HSL, RGBA, HSLA values.

Color Names

In HTML, a color can be specified by using a color name:



HTML supports 140 standard color names.

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_names

CSS COLORS

Background Color

You can set the background color for HTML elements:

Hello World

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.

```
<h1 style="background-color:DodgerBlue;">Hello World</h1>  
<p style="background-color:Tomato;">Lorem ipsum...</p>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_background

CSS COLORS

Text Color

You can set the color of text:

Hello World

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat.

Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat.

```
<h1 style="color:Tomato;">Hello World</h1>
<p style="color:DodgerBlue;">Lorem ipsum...</p>
<p style="color:MediumSeaGreen;">Ut wisi enim...</p>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_text

CSS COLORS

Border Color

You can set the color of borders:

Hello World

Hello World

Hello World

```
<h1 style="border:2px solid Tomato;">Hello World</h1>  
<h1 style="border:2px solid DodgerBlue;">Hello World</h1>  
<h1 style="border:2px solid Violet;">Hello World</h1>
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_border

CSS COLORS

Color Values

In HTML, colors can also be specified using RGB values, HEX values, HSL values, RGBA values, and HSLA values:

Same as color name "Tomato":

`rgb(255, 99, 71)`

`#ff6347`

`hsl(9, 100%, 64%)`

Same as color name "Tomato", but 50% transparent:

`rgba(255, 99, 71, 0.5)`

`hsla(9, 100%, 64%, 0.5)`

```
<h1 style="background-color:rgb(255, 99, 71);">...</h1>
<h1 style="background-color:#ff6347;">...</h1>
<h1 style="background-color:hsl(9, 100%, 64%);">...</h1>
```

```
<h1 style="background-color:rgba(255, 99, 71, 0.5);">...</h1>
<h1 style="background-color:hsla(9, 100%, 64%, 0.5);">...</h1>
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_values

CSS COLORS

RGB Value

In HTML, a color can be specified as an RGB value, using this formula:

`rgb(red, green, blue)`

Each parameter (red, green, and blue) defines the intensity of the color between 0 and 255.

For example, `rgb(255, 0, 0)` is displayed as red, because red is set to its highest value (255) and the others are set to 0.

To display the color black, all color parameters must be set to 0, like this: `rgb(0, 0, 0)`.

To display the color white, all color parameters must be set to 255, like this: `rgb(255, 255, 255)`.

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=try_css_color_rgb2

`rgb(255, 0, 0)`

`rgb(60, 179, 113)`

`rgb(255, 165, 0)`

`rgb(0, 0, 255)`

`rgb(238, 130, 238)`

`rgb(106, 90, 205)`

CSS COLORS

RGB Value Continued

Shades of gray are often defined using equal values for all the 3 light sources:

<code>rgb(0, 0, 0)</code>	<code>rgb(60, 60, 60)</code>
<code>rgb(120, 120, 120)</code>	<code>rgb(180, 180, 180)</code>
<code>rgb(240, 240, 240)</code>	<code>rgb(255, 255, 255)</code>

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_rgb_gray

CSS COLORS

HEX Value

In HTML, a color can be specified using a hexadecimal value in the form:

#rrggbb

Where rr (red), gg (green) and bb (blue) are hexadecimal values between 00 and ff (same as decimal 0-255).

For example, #ff0000 is displayed as red, because red is set to its highest value (ff) and the others are set to the lowest value (00).

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hex2

#ff0000

#3cb371

#ffa500

#0000ff

#ee82ee

#6a5acd

CSS COLORS

HEX Value Continued

Shades of gray are often defined using equal values for all the 3 light sources:



Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hex_gray

CSS COLORS

HSL Value

In HTML, a color can be specified using **hue, saturation, and lightness** (HSL) in the form:

`hsl (hue, saturation, lightness)`

Hue is a degree on the color wheel from 0 to 360. 0 is red, 120 is green, and 240 is blue.

Saturation is a percentage value, 0% means a shade of gray, and 100% is the full color.

Lightness is also a percentage, 0% is black, 50% is neither light or dark, 100% is white

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hsl2

`hsl(0, 100%, 50%)`

`hsl(147, 50%, 47%)`

`hsl(39, 100%, 50%)`

`hsl(240, 100%, 50%)`

`hsl(300, 76%, 72%)`

`hsl(248, 53%, 58%)`

CSS COLORS

Saturation

Saturation can be describe as the intensity of a color.

100% is pure color, no shades of gray

50% is 50% gray, but you can still see the color.

0% is completely gray, you can no longer see the color.

<code>hsl(0, 100%, 50%)</code>	<code>hsl(0, 80%, 50%)</code>
<code>hsl(0, 60%, 50%)</code>	<code>hsl(0, 40%, 50%)</code>
<code>hsl(0, 20%, 50%)</code>	<code>hsl(0, 0%, 50%)</code>

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hsl_saturation

CSS COLORS

Lightness

The lightness of a color can be described as how much light you want to give the color, where 0% means no light (black), 50% means 50% light (neither dark nor light) 100% means full lightness (white).

<code>hsl(0, 100%, 0%)</code>	<code>hsl(0, 100%, 25%)</code>
<code>hsl(0, 100%, 50%)</code>	<code>hsl(0, 100%, 75%)</code>
<code>hsl(0, 100%, 90%)</code>	<code>hsl(0, 100%, 100%)</code>

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hsl_lightness

CSS COLORS

Lightness Continued

Shades of gray are often defined by setting the hue and saturation to 0, and adjust the lightness from 0% to 100% to get darker/lighter shades:



```
hsl(0, 0%, 0%)
```

```
hsl(0, 0%, 24%)
```

```
hsl(0, 0%, 47%)
```

```
hsl(0, 0%, 71%)
```

```
hsl(0, 0%, 94%)
```

```
hsl(0, 0%, 100%)
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hsl_gray

CSS COLORS

RGBA Value

RGBA color values are an extension of RGB color values with an alpha channel - which specifies the opacity for a color.

An RGBA color value is specified with:

`rgba(red, green, blue, alpha)`

The alpha parameter is a number between 0.0 (fully transparent) and 1.0 (not transparent at all):



Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_rgba2

CSS COLORS

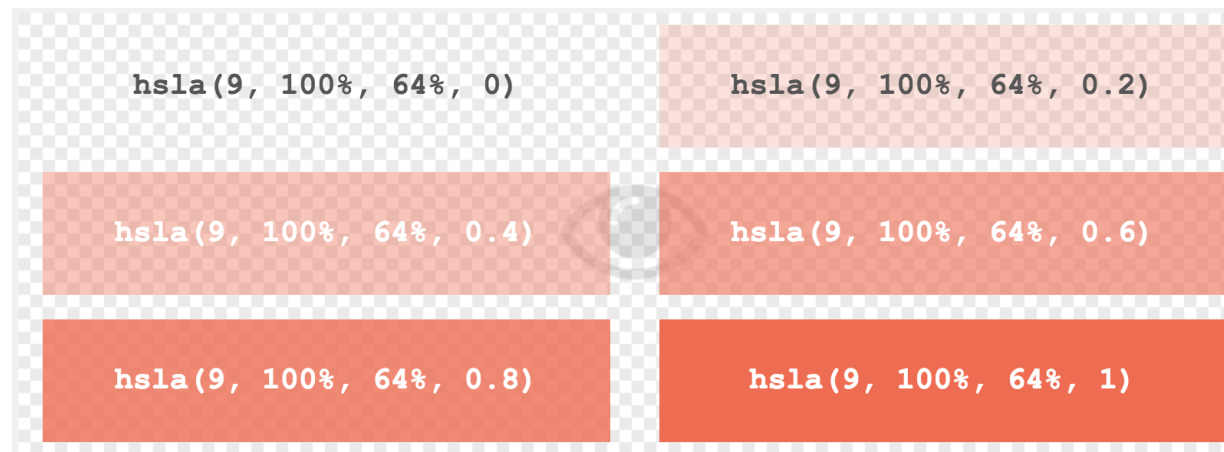
HSLA Value

HSLA color values are an extension of HSL color values with an alpha channel - which specifies the opacity for a color.

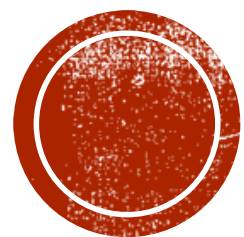
An HSLA color value is specified with:

`hsla(hue, saturation, lightness, alpha)`

The alpha parameter is a number between 0.0 (fully transparent) and 1.0 (not transparent at all):



Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_color_hsla2



CSS BACKGROUNDS

Web Application Development

CSS BACKGROUNDS

The CSS background properties are used to define the background effects for elements.

CSS background properties:

- background-color
- background-image
- background-repeat
- background-attachment
- background-position

CSS BACKGROUNDS

Background Color

The `background-color` property specifies the background color of an element.

The background color of a page is set like this:

```
body {  
    background-color: lightblue;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-color_body

CSS BACKGROUNDS

Background Color Continued

With CSS, a color is most often specified by:

- a valid color name - like "red"
- a HEX value - like "#ff0000"
- an RGB value - like "rgb(255,0,0)"

Look at [CSS Color Values](#) for a complete list of possible color values.

In the example to the right, the <h1>, <p>, and <div> elements have different background colors.

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-color_elements

```
h1 {  
    background-color: green;  
}  
  
div {  
    background-color: lightblue;  
}  
  
p {  
    background-color: yellow;  
}
```


CSS BACKGROUNDS

Background Image

The background-image property specifies an image to use as the background of an element.

By default, the image is repeated so it covers the entire element.

The background image for a page can be set like this:

```
body {  
    background-image: url("paper.gif");  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image

Below is an example of a **bad** combination of text and background image. The text is hardly readable:

```
body {  
    background-  
image: url("bgdesert.jpg");  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_bad

Note: When using a background image, use an image that does not interfere with the readability of the text.

CSS BACKGROUNDS

Background Image - Repeat Horizontally or Vertically

By default, the `background-image` property **repeats** an image both horizontally and vertically.

Some images should be repeated only horizontally or vertically, or they will look strange, like this:

```
body {  
    background-image: url("gradient_bg.png");  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_gradient1

Hello World!

Strange background image...

CSS BACKGROUNDS

Background Image - Repeat Horizontally or Vertically Continued

If the image from the previous slide is repeated only horizontally (background-repeat: repeat-x;), the background will look better:

```
body {  
    background-image: url("gradient_bg.png");  
    background-repeat: repeat-x;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_gradient2

Hello World!

Here, a background image is repeated only horizontally!

CSS BACKGROUNDS

Background Image - Set position and no-repeat

Showing the background image only once is also specified by the `background-repeat` property:

```
body {  
    background-image: url("img_tree.png");  
    background-repeat: no-repeat;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_norepeat

Hello World!

W3Schools background image example.

The background image is only showing once, but it is disturbing the reader!



CSS BACKGROUNDS

Background Image - Set position and no-repeat Continued

In the example on the previous slide, the background image is shown in the same place as the text. We want to change the position of the image, so that it does not disturb the text too much.

The position of the image is specified by the `background-position` property:

```
body {  
    background-image: url("img_tree.png");  
    background-repeat: no-repeat;  
    background-position: right top;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_position

Hello World!

W3Schools background no-repeat, set position example.

Now the background image is only shown once, and positioned away from the text.

In this example we have also added a margin on the right side, so the background image will never disturb the text.



CSS BACKGROUNDS

Background Image - Fixed position

To specify that the background image should be fixed (will not scroll with the rest of the page), use the `background-attachment` property:

```
body {  
    background-image: url("img_tree.png");  
    background-repeat: no-repeat;  
    background-position: right top;  
    background-attachment: fixed;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background-image_attachment

Hello World!

The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.
The background-image is fixed. Try to scroll down the page.



CSS BACKGROUNDS

Background - Shorthand property

To shorten the code, it is also possible to specify all the background properties in one single property. This is called a shorthand property.

The shorthand property for background is background:

```
body {  
    background: #ffffff url("img_tree.png") no-repeat right top;  
}
```

When using the shorthand property the order of the property values is:

- background-color
- background-image
- background-repeat
- background-attachment
- background-position

It does not matter if one of the property values is missing, as long as the other ones are in this order.

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_background_shorthand

CSS BACKGROUNDS

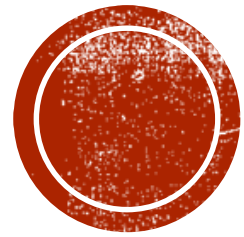
Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)
- [Exercise 5](#)

CSS BACKGROUNDS

All CSS Background Properties

Property	Description
<u>background</u>	Sets all the background properties in one declaration
<u>background-attachment</u>	Sets whether a background image is fixed or scrolls with the rest of the page
<u>background-clip</u>	Specifies the painting area of the background
<u>background-color</u>	Sets the background color of an element
<u>background-image</u>	Sets the background image for an element
<u>background-origin</u>	Specifies where the background image(s) is/are positioned
<u>background-position</u>	Sets the starting position of a background image
<u>background-repeat</u>	Sets how a background image will be repeated
<u>background-size</u>	Specifies the size of the background image(s)



CSS BORDERS

Web Application Development

CSS BORDERS

CSS Border Properties

The CSS border properties allow you to specify the style, width, and color of an element's border.

I have borders on all sides.

I have a red bottom border.

I have rounded borders.

I have a blue left border.

CSS BORDERS

Border Style

The `border-style` property specifies what kind of border to display.

The following values are allowed:

- `dotted` - Defines a dotted border
- `dashed` - Defines a dashed border
- `solid` - Defines a solid border
- `double` - Defines a double border
- `groove` - Defines a 3D grooved border. The effect depends on the border-color value
- `ridge` - Defines a 3D ridged border. The effect depends on the border-color value
- `inset` - Defines a 3D inset border. The effect depends on the border-color value
- `outset` - Defines a 3D outset border. The effect depends on the border-color value
- `none` - Defines no border
- `hidden` - Defines a hidden border

The `border-style` property can have from one to four values (for the top border, right border, bottom border, and the left border).

CSS BORDERS

Border Style Continued

Example:

```
p.dotted {border-style: dotted;}
p.dashed {border-style: dashed;}
p.solid {border-style: solid;}
p.double {border-style: double;}
p.groove {border-style: groove;}
p.ridge {border-style: ridge;}
p.inset {border-style: inset;}
p.outset {border-style: outset;}
p.none {border-style: none;}
p.hidden {border-style: hidden;}
p.mix {border-style: dotted dashed
solid double;}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border-style

Result:

A dotted border.

A dashed border.

A solid border.

A double border.

A groove border. The effect depends on the border-color value.

A ridge border. The effect depends on the border-color value.

An inset border. The effect depends on the border-color value.

An outset border. The effect depends on the border-color value.

No border.

A hidden border.

A mixed border.

Note: None of the OTHER CSS border properties described in the next slides will have ANY effect unless the border-style property is set!

CSS BORDERS

Border Width

The `border-width` property specifies the width of the four borders.

The width can be set as a specific size (in px, pt, cm, em, etc) or by using one of the three pre-defined values: thin, medium, or thick.

The `border-width` property can have from one to four values (for the top border, right border, bottom border, and the left border).



5px border-width

```
p.one {  
    border-style: solid;  
    border-width: 5px;  
}  
  
p.two {  
    border-style: solid;  
    border-width: medium;  
}  
  
p.three {  
    border-style: solid;  
    border-width: 2px 10px 4px 20px;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_border-width

CSS BORDERS

Border Color

The border-color property is used to set the color of the four borders.

The color can be set by:

- name - specify a color name, like "red"
- Hex - specify a hex value, like "#ff0000"
- RGB - specify a RGB value, like "rgb(255,0,0)"
- transparent

The border-color property can have from one to four values (for the top border, right border, bottom border, and the left border).

If border-color is not set, it inherits the color of the element.

```
p.one {  
    border-style: solid;  
    border-color: red;  
}  
  
p.two {  
    border-style: solid;  
    border-color: green;  
}  
  
p.three {  
    border-style: solid;  
    border-color: red green  
blue yellow;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border-color1

CSS BORDERS

Border - Individual Sides

From the examples in the previous slides you have seen that it is possible to specify a different border for each side.

In CSS, there are also properties for specifying each of the borders (top, right, bottom, and left):



Different Border Styles

```
p {  
    border-top-style: dotted;  
    border-right-style: solid;  
    border-bottom-style: dotted;  
    border-left-style: solid;  
}
```

The example above gives the same result as this:

```
p {  
    border-style: dotted solid;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_border-side2

CSS BORDERS

Border - Individual Sides Continued

So, here is how it works:

If the `border-style` property has four values:

- **`border-style: dotted solid double dashed;`**
 - top border is dotted
 - right border is solid
 - bottom border is double
 - left border is dashed

If the `border-style` property has two values:

- **`border-style: dotted solid;`**
 - top and bottom borders are dotted
 - right and left borders are solid

If the `border-style` property has three values:

- **`border-style: dotted solid double;`**
 - top border is dotted
 - right and left borders are solid
 - bottom border is double

If the `border-style` property has one value:

- **`border-style: dotted;`**
 - all four borders are dotted

The `border-style` property is used in the example above. However, it also works with `border-width` and `border-color`.

CSS BORDERS

Border - Shorthand Property

As you can see from the examples on the previous slides, there are many properties to consider when dealing with borders.

To shorten the code, it is also possible to specify all the individual border properties in one property.


The border property is a shorthand property for the following individual border properties:

- border-width
- border-style (required)
- border-color

Example:

```
p {  
    border: 5px solid red;  
}
```

Result:



Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border

CSS BORDERS

Border - Shorthand Property Continued

You can also specify all the individual border properties for just one side:

```
p {  
    border-left: 6px solid red;  
    background-color: lightgrey;  
}
```

Result:

Some text

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border_left

CSS BORDERS

Border - Shorthand Property Continued

Bottom Border:

```
p {  
    border-bottom: 6px solid red;  
    background-color: lightgrey;  
}
```

Result:

Some text

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border_bottom

CSS BORDERS

Rounded Borders

The `border-radius` property is used to add rounded borders to an element:

```
p {  
    border: 2px solid red;  
    border-radius: 5px;  
}
```

Normal border

Round border

Rounder border

Roudest border

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_border_round

Note: The `border-radius` property is not supported in IE8 and earlier versions.

CSS BORDERS

More Examples

- All the top border properties in one declaration
This example demonstrates a shorthand property for setting all of the properties for the top border in one declaration.
- Set the style of the bottom border
This example demonstrates how to set the style of the bottom border.
- Set the width of the left border
This example demonstrates how to set the width of the left border.
- Set the color of the four borders
This example demonstrates how to set the color of the four borders. It can have from one to four colors.
- Set the color of the right border
This example demonstrates how to set the color of the right border.

CSS BORDERS

Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)

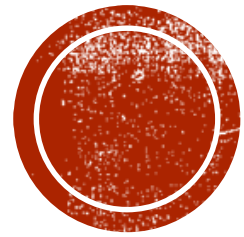
CSS BORDERS

All CSS Border Properties

Property	Description
<u>border</u>	Sets all the border properties in one declaration
<u>border-bottom</u>	Sets all the bottom border properties in one declaration
<u>border-bottom-color</u>	Sets the color of the bottom border
<u>border-bottom-style</u>	Sets the style of the bottom border
<u>border-bottom-width</u>	Sets the width of the bottom border
<u>border-color</u>	Sets the color of the four borders
<u>border-left</u>	Sets all the left border properties in one declaration
<u>border-left-color</u>	Sets the color of the left border
<u>border-left-style</u>	Sets the style of the left border
<u>border-left-width</u>	Sets the width of the left border

Property	Description
<u>border-radius</u>	Sets all the four border-*-radius properties for rounded corners
<u>border-right</u>	Sets all the right border properties in one declaration
<u>border-right-color</u>	Sets the color of the right border
<u>border-right-style</u>	Sets the style of the right border
<u>border-right-width</u>	Sets the width of the right border
<u>border-style</u>	Sets the style of the four borders
<u>border-top</u>	Sets all the top border properties in one declaration
<u>border-top-color</u>	Sets the color of the top border
<u>border-top-style</u>	Sets the style of the top border
<u>border-top-width</u>	Sets the width of the top border
<u>border-width</u>	Sets the width of the four borders





CSS MARGINS

Web Application Development

CSS MARGINS

CSS Margins

The CSS `margin` properties are used to create space around elements, outside of any defined borders.

With CSS, you have full control over the margins. There are properties for setting the margin for each side of an element (top, right, bottom, and left).

This element has a margin of 70px.

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_intro

CSS MARGINS

Margin - Individual Sides

CSS has properties for specifying the margin for each side of an element:

- `margin-top`
- `margin-right`
- `margin-bottom`
- `margin-left`

All the margin properties can have the following values:

- `auto` - the browser calculates the margin
- *length* - specifies a margin in px, pt, cm, etc.
- `%` - specifies a margin in % of the width of the containing element
- `inherit` - specifies that the margin should be inherited from the parent element

Tip: Negative values are allowed.

The following example sets different margins for all four sides of a `<p>` element:

Example:

```
p {  
    margin-top: 100px;  
    margin-bottom: 100px;  
    margin-right: 150px;  
    margin-left: 80px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_sides

CSS MARGINS

Margin - Shorthand Property

To shorten the code, it is possible to specify all the margin properties in one property.

The margin property is a shorthand property for the following individual margin properties:

- margin-top
- margin-right
- margin-bottom
- margin-left

CSS MARGINS

Margin - Shorthand Property Continued

So, here is how it works:

If the `margin` property has four values:

- **`margin: 25px 50px 75px 100px;`**
 - top margin is 25px
 - right margin is 50px
 - bottom margin is 75px
 - left margin is 100px

```
p {  
    margin: 25px 50px 75px 100px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_shorthand_4val

CSS MARGINS

Margin - Shorthand Property Continued

If the `margin` property has three values:

- **`margin: 25px 50px 75px;`**
 - top margin is 25px
 - right and left margins are 50px
 - bottom margin is 75px

```
p {  
    margin: 25px 50px 75px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_shorthand_3val

CSS MARGINS

Margin - Shorthand Property Continued

If the `margin` property has two values:

- **`margin: 25px 50px;`**
 - top and bottom margins are 25px
 - right and left margins are 50px

```
p {  
    margin: 25px 50px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_shorthand_2val

CSS MARGINS

Margin - Shorthand Property Continued

If the `margin` property has one value:

- **`margin: 25px;`**
 - all four margins are 25px

```
p {  
    margin: 25px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_shorthand_1val

CSS MARGINS

The auto Value

You can set the margin property to auto to horizontally center the element within its container.

The element will then take up the specified width, and the remaining space will be split equally between the left and right margins:

```
div {  
    width: 300px;  
    margin: auto;  
    border: 1px solid red;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_auto

CSS MARGINS

The inherit Value

This example lets the left margin of the `<p class="ex1">` element be inherited from the parent element (`<div>`):

```
div {  
    border: 1px solid red;  
    margin-left: 100px;  
}  
  
p.ex1 {  
    margin-left: inherit;  
}
```

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin-left_inherit

CSS MARGINS

Margin Collapse

Top and bottom margins of elements are sometimes collapsed into a single margin that is equal to the largest of the two margins.

This does not happen on left and right margins! Only top and bottom margins!

Look at the following example:

```
h1 {  
    margin: 0 0 50px 0;  
}  
  
h2 {  
    margin: 20px 0 0 0;  
}
```

In the example above, the `<h1>` element has a bottom margin of 50px and the `<h2>` element has a top margin set to 20px.

Common sense would seem to suggest that the vertical margin between the `<h1>` and the `<h2>` would be a total of 70px (50px + 20px). But due to margin collapse, the actual margin ends up being 50px.

Try it Yourself: https://www.w3schools.com/Css/tryit.asp?filename=trycss_margin_collapse

CSS MARGINS

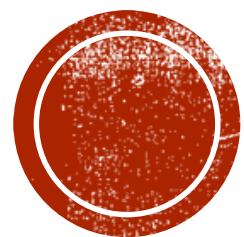
Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)

CSS MARGINS

All CSS Margin Properties

Property	Description
<u>margin</u>	A shorthand property for setting the margin properties in one declaration
<u>margin-bottom</u>	Sets the bottom margin of an element
<u>margin-left</u>	Sets the left margin of an element
<u>margin-right</u>	Sets the right margin of an element
<u>margin-top</u>	Sets the top margin of an element



CSS PADDING

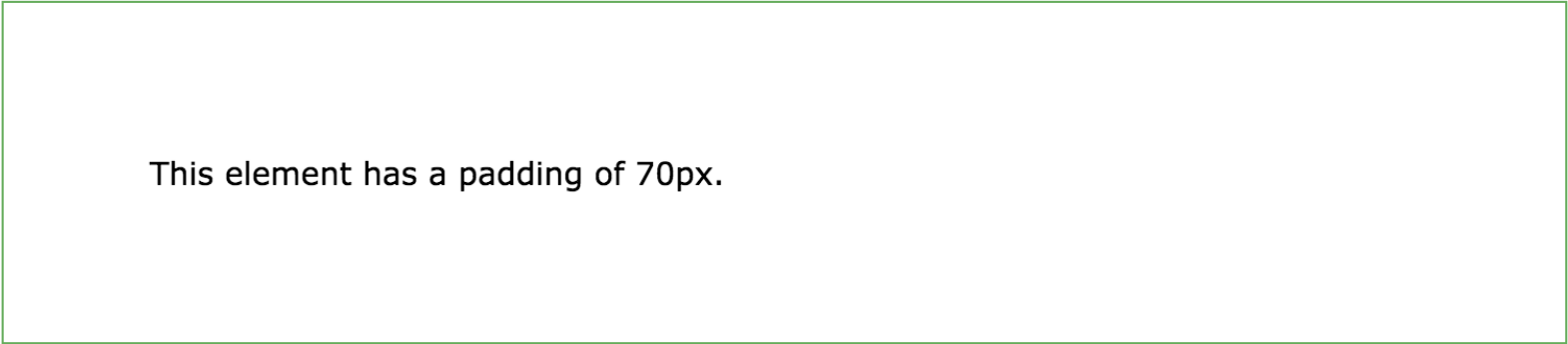
Web Application Development

CSS PADDING

CSS Padding

The CSS `padding` properties are used to generate space around an element's content, inside of any defined borders.

With CSS, you have full control over the padding. There are properties for setting the padding for each side of an element (top, right, bottom, and left).



This element has a padding of 70px.

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_intro

CSS PADDING

Padding - Individual Sides

CSS has properties for specifying the padding for each side of an element:

- padding-top
- padding-right
- padding-bottom
- padding-left

All the padding properties can have the following values:

- *length* - specifies a padding in px, pt, cm, etc.
- % - specifies a padding in % of the width of the containing element
- inherit - specifies that the padding should be inherited from the parent element

Note: Negative values are not allowed.

The example to the right sets different padding for all four sides of a <div> element.

Example:

```
div {  
    padding-top: 50px;  
    padding-right: 30px;  
    padding-bottom: 50px;  
    padding-left: 80px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_sides

CSS PADDING

Padding - Shorthand Property

To shorten the code, it is possible to specify all the padding properties in one property.

The `padding` property is a shorthand property for the following individual padding properties:

- `padding-top`
- `padding-right`
- `padding-bottom`
- `padding-left`

CSS PADDING

Padding - Shorthand Property Continued

So, here is how it works:

If the `padding` property has four values:

- **`padding: 25px 50px 75px 100px;`**
 - top padding is 25px
 - right padding is 50px
 - bottom padding is 75px
 - left padding is 100px

```
div {  
    padding: 25px 50px 75px 100px;  
}
```

Try it yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_shorthand_4val

CSS PADDING

Padding - Shorthand Property Continued

If the `padding` property has three values:

- **`padding: 25px 50px 75px;`**
 - top padding is 25px
 - right and left paddings are 50px
 - bottom padding is 75px

```
div {  
    padding: 25px 50px 75px;  
}
```

Try it yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_shorthand_3va1

CSS PADDING

Padding - Shorthand Property Continued

If the `padding` property has two values:

- **`padding: 25px 50px;`**
 - top and bottom paddings are 25px
 - right and left paddings are 50px

```
div {  
    padding: 25px 50px;  
}
```

Try it yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_shorthand_2va1

CSS PADDING

Padding - Shorthand Property Continued

If the `padding` property has one value:

- **`padding: 25px;`**
 - all four paddings are 25px

```
div {  
    padding: 25px;  
}
```

Try it yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_shorthand_1val

CSS PADDING

Padding and Element Width

The CSS `width` property specifies the width of the element's content area. The content area is the portion inside the padding, border, and margin of an element ([the box model](#)).

So, if an element has a specified width, the padding added to that element will be added to the total width of the element. This is often an undesirable result.

In the following example, the `<div>` element is given a width of 300px. However, the actual rendered width of the `<div>` element will be 350px (300px + 25px of left padding + 25px of right padding):

```
div {  
    width: 300px;  
    padding: 25px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_width

CSS PADDING

Padding and Element Width Continued

To keep the width at 300px, no matter the amount of padding, you can use the `box-sizing` property. This causes the element to maintain its width; if you increase the padding, the available content space will decrease. Here is an example:

```
div {  
    width: 300px;  
    padding: 25px;  
    box-sizing: border-box;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_padding_width2

CSS PADDING

More Examples

- Set the left padding
This example demonstrates how to set the left padding of a <p> element.
- Set the right padding
This example demonstrates how to set the right padding of a <p> element.
- Set the top padding
This example demonstrates how to set the top padding of a <p> element.
- Set the bottom padding
This example demonstrates how to set the bottom padding of a <p> element.

CSS PADDING

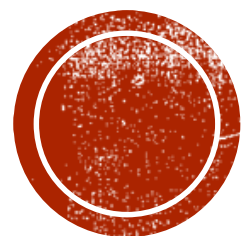
Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)

CSS PADDING

All CSS Padding Properties

Property	Description
<u>padding</u>	A shorthand property for setting all the padding properties in one declaration
<u>padding-bottom</u>	Sets the bottom padding of an element
<u>padding-left</u>	Sets the left padding of an element
<u>padding-right</u>	Sets the right padding of an element
<u>padding-top</u>	Sets the top padding of an element



CSS HEIGHT AND WIDTH

Web Application Development

CSS HEIGHT AND WIDTH

Setting height and width

The `height` and `width` properties are used to set the height and width of an element.

The `height` and `width` can be set to `auto` (this is default. Means that the browser calculates the height and width), or be specified in *length values*, like `px`, `cm`, etc., or in percent (%) of the containing block.

```
div {  
    height: 200px;  
    width: 50%;  
    background-color: powderblue;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_dim_height_width2

Note: The height and width properties do not include padding, borders, or margins; they set the height/width of the area inside the padding, border, and margin of the element!

CSS HEIGHT AND WIDTH

Setting height and width

The `max-width` property is used to set the maximum width of an element.

The `max-width` can be specified in *length values*, like px, cm, etc., or in percent (%) of the containing block, or set to none (this is default. Means that there is no maximum width).

The problem with the `<div>` on the previous slide occurs when the browser window is smaller than the width of the element (500px). The browser then adds a horizontal scrollbar to the page.

Using `max-width` instead, in this situation, will improve the browser's handling of small windows.

Note: The value of the `max-width` property overrides width.

CSS HEIGHT AND WIDTH

Setting height and width Continued

The following example shows a `<div>` element with a height of 100 pixels and a max-width of 500 pixels:

```
div {  
    max-width: 500px;  
    height: 100px;  
    background-color: powderblue;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_dim_max_width

CSS HEIGHT AND WIDTH

Try it Yourself - Examples

- Set the height and width of elements

This example demonstrates how to set the height and width of different elements.

- Set the height and width of an image using percent

This example demonstrates how to set the height and width of an image using a percent value.

- Set min-width and max-width of an element

This example demonstrates how to set a minimum width and a maximum width of an element using a pixel value.

- Set min-height and max-height of an element

This example demonstrates how to set a minimum height and a maximum height of an element using a pixel value.

CSS HEIGHT AND WIDTH

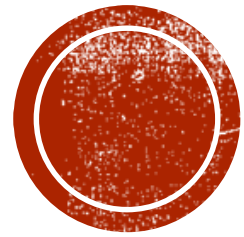
Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)

CSS HEIGHT AND WIDTH

All CSS Dimension Properties

Property	Description
<u>height</u>	Sets the height of an element
<u>max-height</u>	Sets the maximum height of an element
<u>max-width</u>	Sets the maximum width of an element
<u>min-height</u>	Sets the minimum height of an element
<u>min-width</u>	Sets the minimum width of an element
<u>width</u>	Sets the width of an element

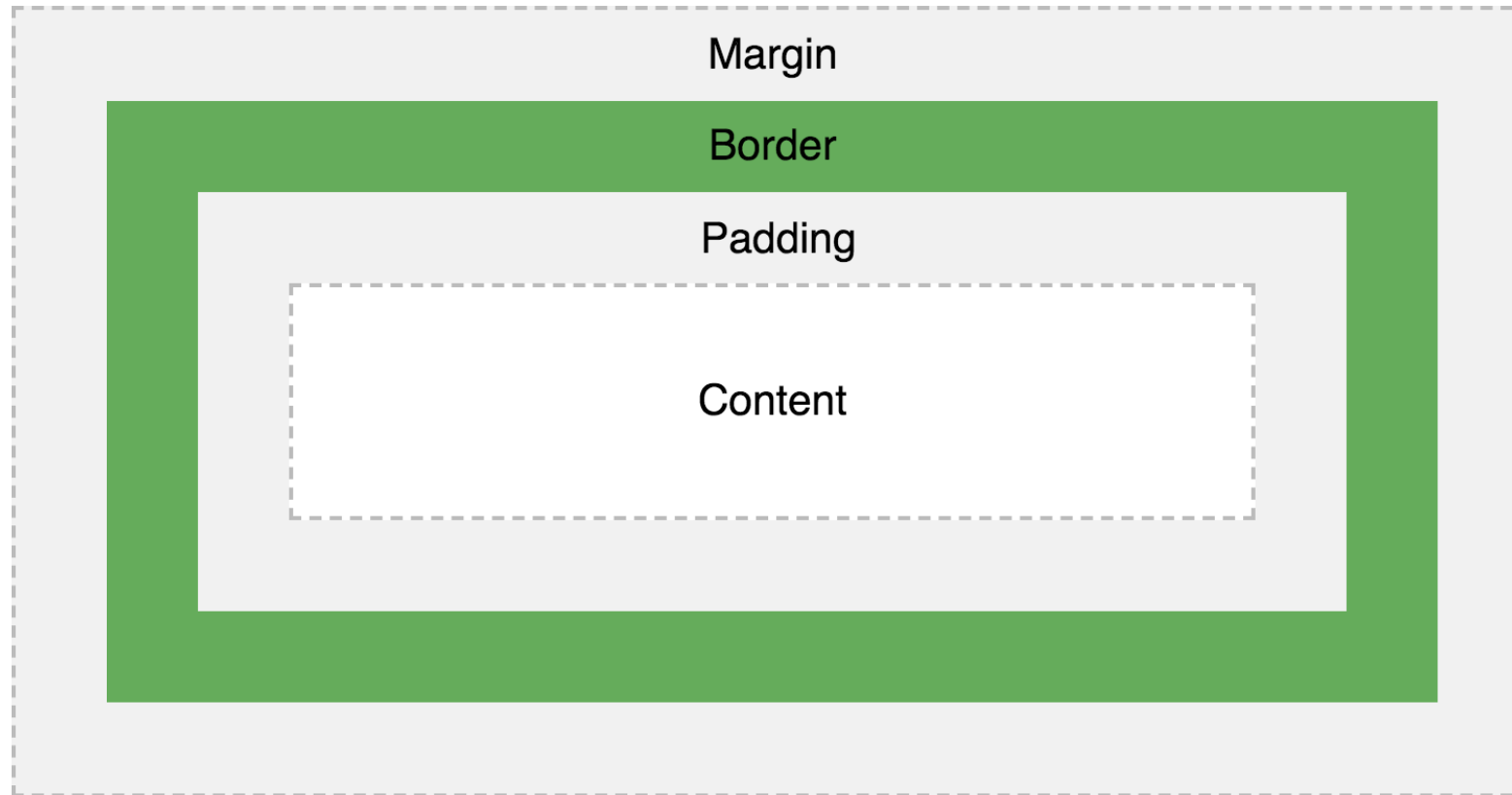


CSS BOX MODEL

Web Application Development

CSS BOX MODEL

The CSS Box Model



CSS BOX MODEL

The CSS Box Model

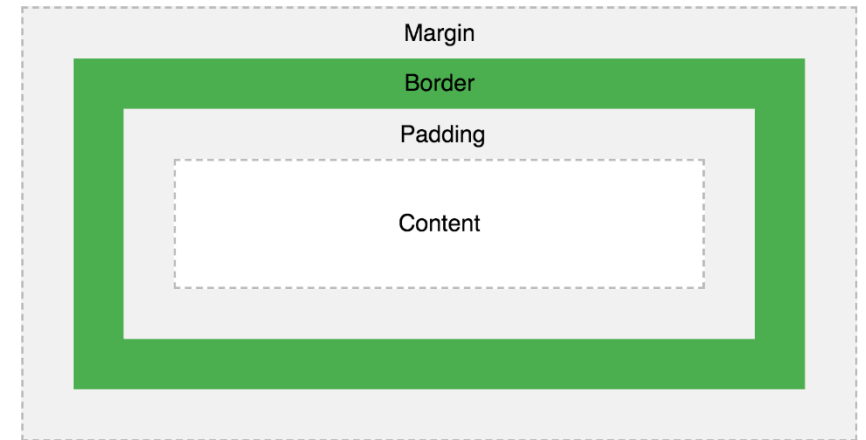
All HTML elements can be considered as boxes. In CSS, the term "box model" is used when talking about design and layout.

The CSS box model is essentially a box that wraps around every HTML element. It consists of: margins, borders, padding, and the actual content. The image to the right illustrates the box model.

Explanation of the different parts:

- **Content** - The content of the box, where text and images appear
- **Padding** - Clears an area around the content. The padding is transparent
- **Border** - A border that goes around the padding and content
- **Margin** - Clears an area outside the border. The margin is transparent

The box model allows us to add a border around elements, and to define space between elements.



Example:

```
div {  
  width: 300px;  
  border: 25px solid green;  
  padding: 25px;  
  margin: 25px;  
}
```

Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_boxmodel

CSS BOX MODEL

Width and Height of an Element

In order to set the width and height of an element correctly in all browsers, you need to know how the box model works.

Assume we want to style a `<div>` element to have a total width of 350px:

```
div {  
    width: 320px;  
    padding: 10px;  
    border: 5px solid gray;  
    margin: 0;  
}
```

Important: When you set the width and height properties of an element with CSS, you just set the width and height of the **content area**. To calculate the full size of an element, you must also add padding, borders and margins.

CSS BOX MODEL

Width and Height of an Element Continued

Here is the calculation:

320px (width)
+ 20px (left + right padding)
+ 10px (left + right border)
+ 0px (left + right margin)
= 350px

The total width of an element should be calculated like this:

Total element width = width + left padding + right padding + left border + right border + left margin + right margin

The total height of an element should be calculated like this:

Total element height = height + top padding + bottom padding + top border + bottom border + top margin + bottom margin

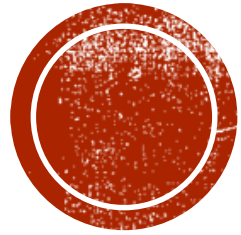
Try it Yourself:

https://www.w3schools.com/Css/tryit.asp?filename=trycss_boxmodel_width

CSS BOX MODEL

Test Yourself with Exercises!

- [Exercise 1](#)
- [Exercise 2](#)
- [Exercise 3](#)
- [Exercise 4](#)



THE END

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