Lesson #3: Cascading Style Sheets (CSS)

What is CSS?

- CSS stands for *Cascading Style Sheets*.
- Styles define how to display HTML elements.
- Styles are normally stored in style sheets.
- External style sheets can save you a lot of work.
- External Style Sheets are stored in .css files.
- Multiple style definitions will cascade into one.
- The CSS1 specification was developed in 1996. CSS2 was released in 1998. CSS3 in 2012.

Advantages of CSS

- CSS allows developers to control the style and layout of multiple Web pages all at once.
- As a Web developer you can define a style for each HTML element and apply it to as many Web pages as you want.
- To make a global change, simply change the style, and all elements in the Web are updated automatically.

Advantages of CSS

- Style sheets allow style information to be specified in many ways.
- Styles can be specified inside a single HTML element, inside the <head> element of an HTML page, or in an external CSS file.
- Even multiple external style sheets can be referenced inside a single HTML document.

The cascading effect

- All the styles will "cascade" into a new "virtual" style sheet by the following rules, where number four has the highest priority:
- 1. Browser default
- 2. External style sheet
- 3. Internal style sheet (inside the <head> tag)
- 4. Inline style (inside an HTML element)

CSS Syntax

- The CSS syntax is made up of three parts: a *selector*, a *property* and a *value*.
- `selector {property: value}`
- The selector is normally the HTML element/tag you wish to define, the property is the attribute you wish to change, and each property can take a value. The property and value are separated by a colon, and surrounded by curly braces.
- `body {color: black}`

CSS Syntax

- If the value is multiple words, put quotes around the value.
- `p {font-family:"sans-serif"}`
- Multiples properties are separated by a ;
- `p {text-align:center;color:red}`
- You can group selectors. Separate each selector with a comma.
- `h1,h2,h3,h4,h5,h6 {color:green}`

The class selector

- With the class selector you can define different styles for the same type of HTML element.
- ```
  p.right {text-align:right}
  p.center {text-align:center}
  ```
- You have to use the class attribute in your HTML document.
- ```
  <p class="right">
  This paragraph will be right-aligned.</p>
  <p class="center">
  This paragraph will be center-aligned.</p>
  ```

Class, id and comments

- You can also omit the tag name in the selector to define a style that will be used by all HTML elements that have a certain class.
- `.center {text-align:center}`
- Do NOT start a class name with a number!
- The id selector is also available. You define it with a pound sign (#) instead of a dot (.).
- Comments in CSS are similar to comments in C. All statements between /* and */ are ignored.

External style sheets

- An external style sheet is ideal when the style is applied to many pages. With an external style sheet, you can change the look of an entire Web site by changing one file. Each page must link to the style sheet using the <link> tag. The <link> tag goes inside the head section.
- **<link rel="stylesheet" type="text/css" href="mystyle.css">**
- An external style sheet can be written in any text editor. The file should not contain any html tags. Your style sheet should be saved with a .css extension.

Internal style sheets

- An internal style sheet should be used when a single document has a unique style. You define internal styles in the head section by using the <style> tag in the head section.

This part optional

-
```
<style type="text/css">
hr {color: sienna}
p {margin-left: 20px}
body
{background-image:url("images/back40.gif
")}
</style>
```

Inline styles

- An inline style loses many of the advantages of style sheets by mixing content with presentation. Use this method sparingly, such as when a style is to be applied to a single occurrence of an element.
- To use inline styles you use the style attribute in the relevant tag.
- `<p style="color:sienna; margin-left:20px">This is a paragraph</p>`

Multiple styles

- If some properties have been set for the same selector in different style sheets, the values will be inherited from the more specific style sheet.
- If specificities are equal, the style that is defined last (closer to the actual tag) will have priority.
- ```
  p {color:blue}
  p {color:red}
  ...
  This is it!
  ```
- What will be the color of that paragraph?
- What of this one? `<p style="color:green">This is it!</p>`
  ```

The background properties

- The CSS background properties allow you to control the background color of an element, set an image as the background, repeat a background image vertically or horizontally, and position an image on a page.
- Properties include *background*, *background-color*, *background-attachment*, *background-image*, *background-position* and *background-repeat*.
- Example:
- `background: #ffffff url("img_tree.png") no-repeat right top;`

The background properties

background: the shorthand property to specify all the properties in one single property (see previous slide).

background-color: as an HEX value("#0000ff"), an RGB value ("rgb(0,0,255)") or a color name ("blue"). background-color: #b0c4de;

background-image: specifies an image background. background-image: url('texture.png');

background-repeat: repeats image in both directions by default. Other possibilities are repeat-x (horizontal only), repeat-y (vertical only), and no-repeat. background-repeat: repeat-y;

The background properties

background-attachment: sets whether a background image is fixed or scrolls with the rest of the page. The popular values are scroll (default), and fixed.
background-attachment: fixed;

background-position: By default, a background-image is placed at the top-left corner of an element, and repeated both vertically and horizontally. The background-position property sets the starting position of a background image. Values can be position names (top left bottom, right, center), pixels or %. The first value is horizontal, the second vertical.
background-position: 50% 50%;

The text properties

- The CSS text properties allow you to control the appearance of text. It is possible to change the color of a text, increase or decrease the space between characters in a text, align a text, decorate a text, indent the first line in a text, and more.
- `h2 {color:#336699}`
- See w3schools.com/css/css_text.asp for more.

The font properties

- The CSS font properties allow you to change the font family, boldness, size, and the style of a text.
- Usually, fonts are identified by a font name. If a browser does not support the specified font, it will use a default font.
- The most common properties are *font-size*, *font-weight*, *font-family* and *font-style*.
- `p {font-size:14px}`
- See w3schools.com/css/css_font.asp for more.

The border properties

- The CSS border properties allow you to specify the style and color of an element's border. In HTML we use tables to create borders around a text, but with the CSS border properties we can create borders with nice effects, and it can be applied to any element.
- `div {border-style:solid; border-color:#0000ff}`
- See w3schools.com/css/css_border.asp for a detailed view of all possible properties.

The margin properties

- The CSS margin properties define the space around elements. It is possible to use negative values to overlap content. The top, right, bottom, and left margin can be changed independently using separate properties. A shorthand margin property can also be used to change all of the margins at once.
- `p.topmargin {margin-top:5cm}`
- See w3schools.com/css/css_margin.asp for a detailed view of all possible properties.

The padding properties

- The CSS padding properties define the space between the element border and the element content. Negative values are not allowed. The top, right, bottom, and left padding can be changed independently using separate properties. A shorthand padding property is also created to control multiple sides at once.
- `td {padding-right:10px}`
- See w3schools.com/css/css_padding.asp to learn more about these properties.

The list properties

- The CSS list properties allow you to place the list-item marker, change between different list-item markers, or set an image as the list-item marker.
- `ul {list-style-image: url('arrow.gif')}`
- See w3schools.com/css/css_list.asp to learn more about these properties.

The dimension properties

- The CSS dimension properties allow you to control the height and width of an element (or the minimum/maximum height or width).

```
div1 {width:300px; height:200px;}
div2 {max-width:300px; min-height:200px;}
```

- See w3schools.com/css/css_dimension.asp to learn more.

The float properties

- With CSS float, an element can be pushed to the left or right, allowing other elements to wrap around it. Float is very often used for images, but it is also useful when working with layouts.
- The elements after the floating element will flow around it. The elements before the floating element will not be affected. If an image is floated to the right, a following text flows around it, to the left:
- `img {float:right;}`
- See w3schools.com/css/css_float.asp

The display properties

- The display property is the most important CSS property for controlling layout. The display property specifies if/how an element is displayed. Every HTML element has a default display value depending on what type of element it is. The default display value for most elements is block or inline.
- See w3schools.com/css/css_display_visibility.asp to learn more.

The position properties

- The position property specifies the type of positioning method used for an element (static, relative, fixed or absolute). Static is the default setting. Positioning settings (top, left,…) have no effect on static.
- `img.x {position:absolute; left:0px; top:0px; z-index:-1}`
- See w3schools.com/css/css_positioning.asp for more examples.

The anchor pseudo-classes

- A link that is active, visited, unvisited, or when you mouse over a link can all be displayed in different ways in a CSS-supporting browser.
- ```
  a:link {color: #FF0000}
  a:visited {color: #00FF00}
  a:hover {color: #FF00FF}
  a:active {color: #0000FF}
  ```
- See w3schools.com/css/css_pseudo_classes.asp for more examples.
  ```

The :first-line pseudo-element

- The "first-line" pseudo-element is used to add special styles to the first line of the text in a selector.
- **`div {font-size: 12pt}`**
- **`div:first-line {color: #0000FF; font-variant: small-caps}`**

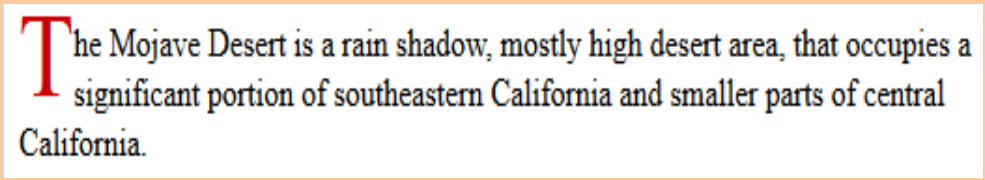
THE MOJAVE DESERT IS A RAIN SHADOW, MOSTLY HIGH DESERT AREA, THAT OCCUPIES A significant portion of southeastern California and smaller parts of central California.

The :first-letter pseudo-element

The "first-letter" pseudo-element is used to add special style to the first letter of the text in a selector.

```
div {font-size: 12pt}

div:first-letter {font-size: 300%; float:
  left; color:#cc0000;}
```



See w3schools.com/css/css_pseudo_elements.asp for more examples to learn more about pseudo elements.

The latest version: CSS3

- CSS3 is split up into modules. The old specification has been split into smaller pieces, and new ones are also added.
- The CSS3 specification is still under development by W3C. However, many of the new CSS3 properties have been implemented in modern browsers.
- CSS3 is completely backwards compatible, so you will not have to change existing designs. Browsers will always support CSS2.

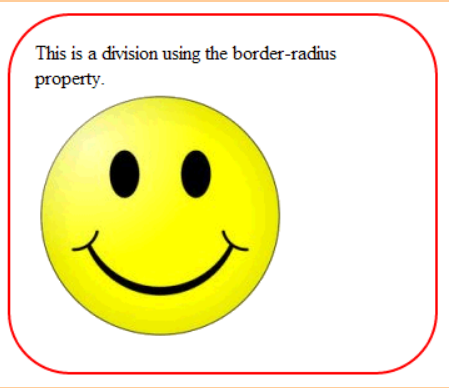
CSS3: Borders

- With CSS3, you can create rounded borders, add shadow to boxes, and use an image as a border.
- The new border properties are: *border-radius*, *box-shadow*, and *border-image*.
- *border-image* is not supported in all browsers and can be a little unpredictable.

CSS3: Borders

- Example of rounded corners with *border-radius*:

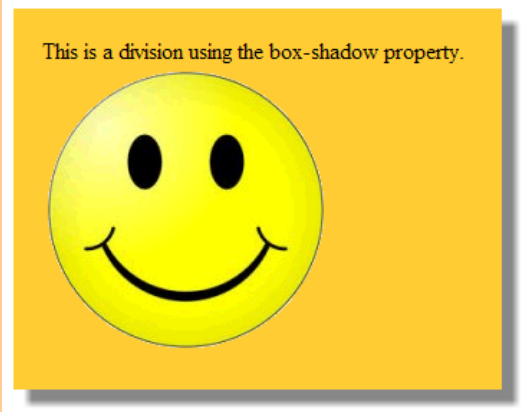
```
border: 2px solid red;
border-radius: 50px 50px 50px 50px;
```



- The four values are given in the order top-left, top-right, bottom-right, bottom-left. If bottom-left is omitted it is the same as top-right. If bottom-right is omitted it is the same as top-left. If top-right is omitted it is the same as top-left.

CSS3: Borders

- ***box-shadow* properties:**
- *h-shadow, v-shadow:* position of the horizontal and vertical shadows. Negative values are allowed. Required.
- *blur:* the blur distance.
- *spread:* size of the shadow.
- *color:* shadow color.
- *inset:* shadow format. outset is the default.




```
background: #ffcc33;
box-shadow: 10px 10px 5px 2px #999999;
```

CSS3: Backgrounds

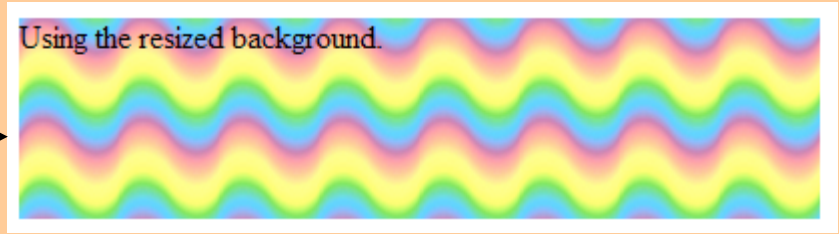
- The background-size property specifies the size of the background image.
- Before CSS3, the background image size was determined by the actual size of the image. In CSS3 it is possible to specify the size of the background image, which allows us to re-use background images in different contexts.

You can specify the size in pixels or in percentages. If you specify the size as a percentage, the size is relative to the width and height of the parent element. See w3schools.com/css/css3_backgrounds.asp for more information.

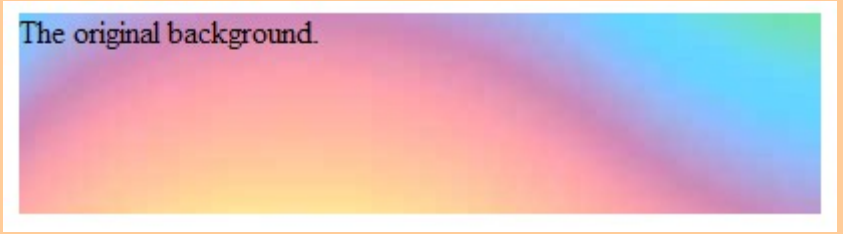
CSS3: Backgrounds

- ***background-size* properties:**
- *width, height: width and height of the resized background.*

```
background-size:50px 50px;
```




```
background-size:50% 50%;
```



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 HTML elements, and it consists of: **margins**, **borders**, **padding**, and the actual **content**.
- The box model allows us to add a border around elements, and to define space between elements.

The CSS Box Model

- **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

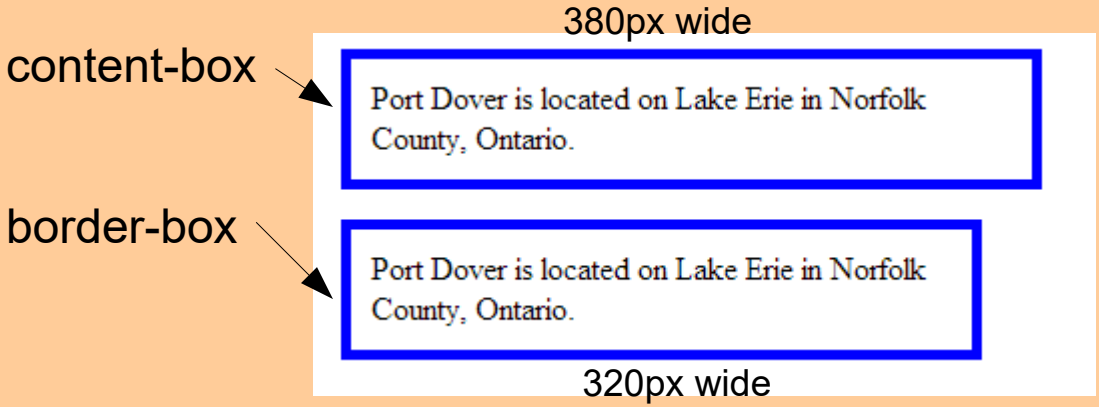
The CSS Box Model

- Working with the box model:
- 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.
- For example: *div {width: 320px;padding: 10px;border: 5px solid blue;margin: 15px;}* *will occupy 380 pixels of width on your web page: 320+2*10+2*5+2*15.*

The CSS Box Model

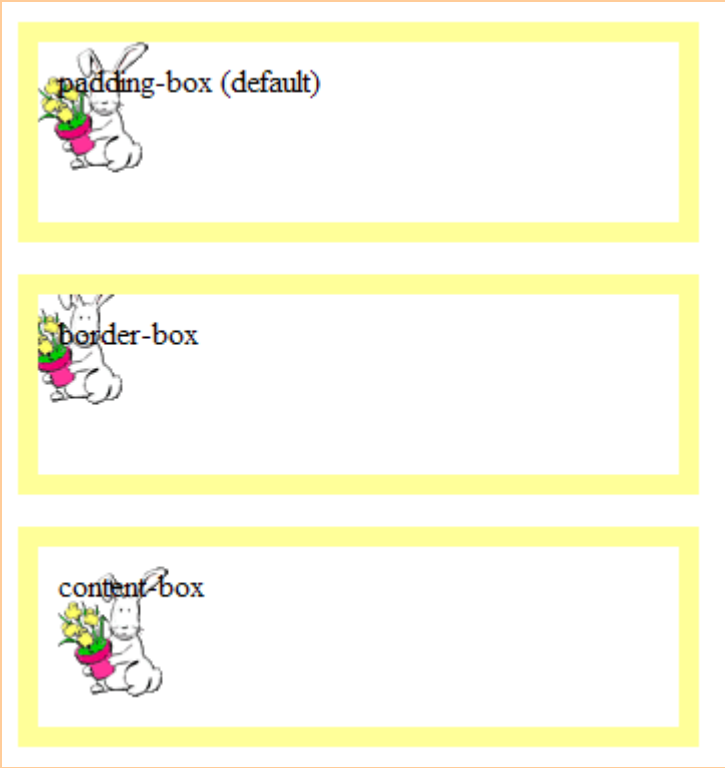
- The box-sizing property is used to specify (override) the default option.
- **content-box:** The width and height properties (and min/max properties) includes only the content. Border, padding, or margin are not included.
- **border-box:** The width and height properties (and min/max properties) includes content, padding and border, but not the margin.

Using the previous slide's settings



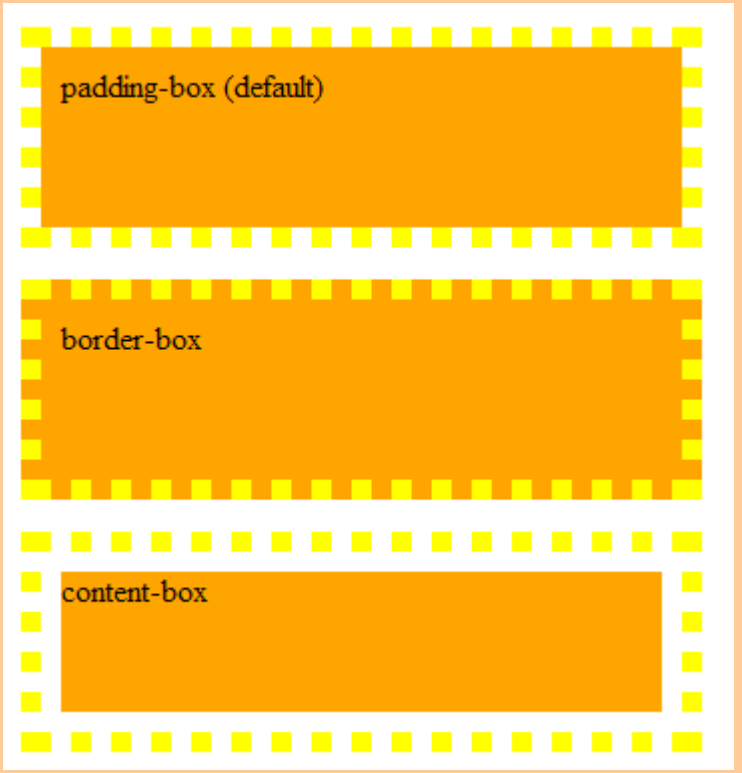
CSS3: Backgrounds

- ***background-origin* property:**
- The background-origin property specifies what the background-position property should be relative to. Three possible values:
- **padding-box**: right inside the border. Default value.
- **border-box**: outside the border. The border is ignored.
- **content-box**: background is placed right where the content will appear (inside the padding).



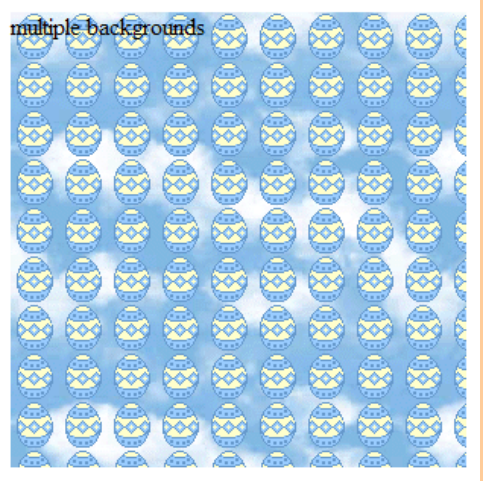
CSS3: Backgrounds

- ***background-clip* property:**
- The background-clip property specifies where the background should appear. Works best with tiled (repeat) textures or solid colors. Three possible values:
- **padding-box**: right inside the border. Default value.
- **border-box**: outside the border. The border is ignored.
- **content-box**: background is placed right where the content will appear (inside the padding).



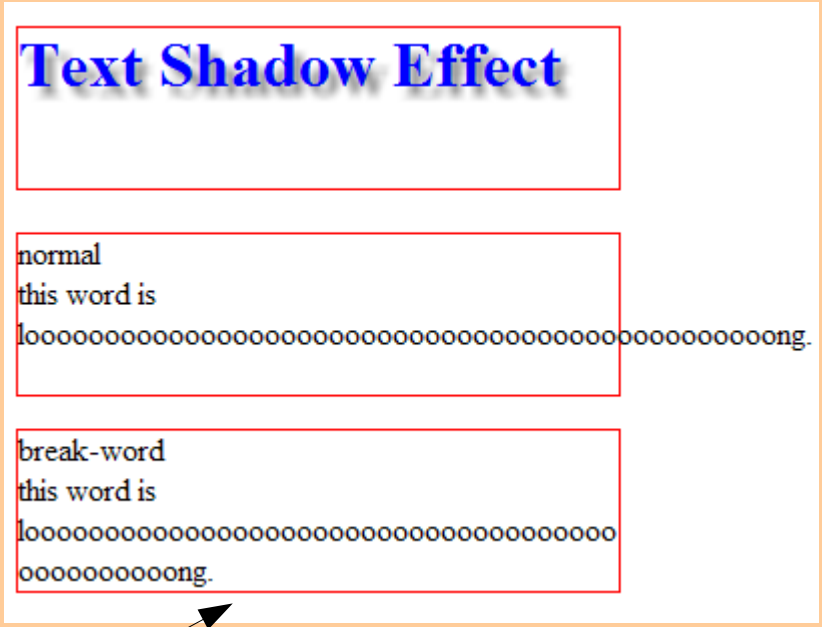
CSS3: Backgrounds

- CSS3 allows you to use several background images for an element.
- Works best with transparent images (only the last one can be non-transparent).
- background-image:url(egg2.gif), url(sky.gif);
- Can also work with gradients to darken or lighten a background.
- **background-image:linear-gradient(rgba(255, 255, 255, 0.9),rgba(255, 255, 255, 0.1)),url('bg.jpg');**
- **background-image:linear-gradient(rgba(0, 0, 0, 0.9),rgba(0, 0, 0, 0.1)),url('bg.jpg');**



CSS3: Text effects

- CSS3 adds a few interesting text effects.
- **text-shadow** specifies a shadow for a text. It has four values, the horizontal and vertical shadow sizes, the blur distance and the shadow color.
- `text-shadow:5px 5px 5px #999999;`
- word-wrap specifies if a long word can be cut if it is longer than the container. The possible values are normal and break-word.
- `word-wrap:break-word;`



CSS3: Fonts

- Before CSS3, web designers had to use fonts that were already installed on the user's computer. With CSS3, web designers can use any font. All you need is to place the font file on the server. Those fonts are defined in the CSS3 @font-face rule.
- The best font formats are TTF, OTF, and WOFF for cross-browser compatibility (recent browsers only).
- In the new @font-face rule you must first define a name for the font (ex: KatyBerry), and then point to the font file. To use the font for an HTML element, refer to the name of the font (KatyBerry) through the font-family property.

```
@font-face
  {font-family: KatyBerry; src: url('kberry.ttf'),}
```

This paragraph uses the KatyBerry custom font.

CSS3: Fonts

- Note: You can't use styles with custom fonts (bold, italic...). Each style must correspond to a different custom font. You may however change the color and the size.

SFCOLLEGIATE NORMAL

SFCOLLEGIATE BOLD

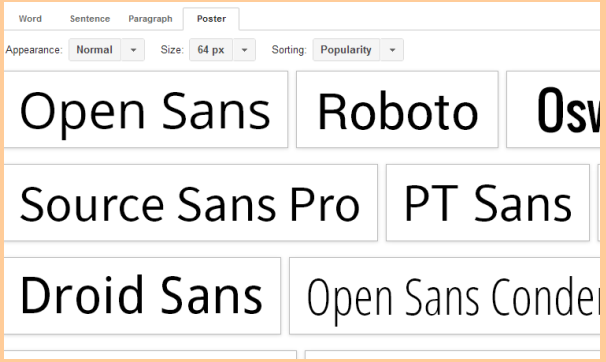
SFCOLLEGIATE ITALIC

```
@font-face{font-
  family:SFCollegiate;src:url('sfc.ttf')}

@font-face{font-family:SFCollegiate;src:url('sfc-
  bold.ttf');font-weight:bold;}

@font-face{font-family:SFCollegiate;src:url('sfc-
  italic.ttf');font-style:italic;}
```

- Go to www.1001freefonts.com to get free fonts for your website or for a simpler method still, use Google fonts at www.google.com/fonts.



CSS3: 2D Transforms

- A transform is an effect that lets an element change shape, size and position. With CSS3 transform, we can move, scale, turn, spin, and stretch elements. It uses the following transform methods: translate(), rotate(), scale(), skew(), and matrix(). These transforms may be used with any HTML element. Prefixes (-moz-, -webkit-, -o-, -ms-) may be necessary during the transition phase.

```
transform:skew(25deg,20deg);
```

Go to
w3schools.com/cssref/css3_pr_transform.asp
to learn more.

CSS3: 3D Transforms

- 3D transforms permit rotation upon the X (rotateX()) or Y (rotateY()) axes in three dimensions. Prefixes (-moz-, -webkit-, -o-, -ms-) may be necessary during the transition phase.

```
#mirror {transform:rotateY(180deg);-moz-
  transform:rotateY(180deg);-webkit-
  transform:rotateY(180deg);
```

Original

Mirror Effect: RotateY at 180 degrees.

CSS3: Transitions

- With CSS3, we can add an effect when changing from one style to another, without using Flash animations or JavaScripts. CSS3 transitions are effects that let an element gradually change from one style to another. To do this, you must specify two things: the CSS property you want to add an effect to and the duration of the effect. The smaller the duration, the fastest the transition will occur.

```
<style type="text/css">

div {transition:width 3s,background-color 3s;-moz-
  transition:width 3s,background-color 3s;-webkit-
  transition:width 3s,background-color 3s;-o-transition:width
  3s,background-color 3s;width:150px;height:250px;background-
  color:blue;}

div:hover {width:300px;background-color:red;}

</style>
```

CSS3: Animations

- With CSS3, we can create animations, which can replace animated images, Flash animations, and JavaScripts in many web pages.
- To create animations in CSS3, you will have to learn about the @keyframes rule. The @keyframes rule is where the animation is created. Specify a CSS style inside the @keyframes rule and the animation will gradually change from the current style to the new style.
- When the animation is created in the @keyframe, it must be bound to a selector. This can be done by specifying at least these two CSS3 animation properties: name and duration.
- You can change as many styles you want, as many times you want. Specify when the change will happen in percent, or the keywords "from" and "to", which is the same as 0% and 100%. 0% is the beginning of the animation, 100% is when the animation is complete.

CSS3: Animations

- Animations are currently supported (with prefixes) only by Mozilla and Webkit browsers.
- The animation property is a shorthand property for six of the animation properties: name (keyframe or none), duration (s or ms), timing-function (linear, ease, ease-in, ease-out or east-in-out), delay (s or ms), iteration-count (n or infinite), and direction (normal or alternate). Always specify the duration property, otherwise the duration is 0, and will never be played. Default values are: *none 0 ease 0 1 normal*
- See example 3.13 at ihypress.net/programming/html

End of lesson