CSS "Reset"

Sometimes it is useful to use a CSS stylesheet to "reset" styling for all elements. This attempts to start your styling with a "blank slate" instead of the browser defaults.

- Eric Meyer's CSS Reset Reloaded
- YUI Reset CSS

Basic Markup:

With CSS Reset:
CSS, Accessibility, and Images

CSS from Eric Meyer for "Reset"

```html
/* remember to define focus styles! */
:focus {
  outline: 0;
}

body {
  line-height: 1;
  color: black;
  background: white;
}
```

CSS for Page Layout: Fixed Width

Define region widths based upon fixed sizes (pixels).

Use "div" elements to define areas and CSS to arrange them on the page.

Example 5.1

In style element (c{style type="text/css"}) within head element:

Example 5.1 Rendered:

- With Styles
- Without Styles
**Liquid Layouts**

Define region width based on percentages (relative to browser window width).

```html
1. <div id="wrapper">
2.   <div id="header">
3.     ...
4.   </div>
5.   <div id="maincontent">
6.     ...
7.   </div>
8. </div>
9. </div>
10. </div>

**Lorem ipsum dolor sit**

- Maecenas
- Cras
- Proin
- Integer
- Integer
- Integer
- Integer
- Integer

**Example 5.2**

*Example 5.2 Source:*
**Elastic Layouts**

Define region widths relative to the base font size.

<table>
<thead>
<tr>
<th>Example 5.2 Rendered:</th>
<th>Example 5.2 Source:</th>
</tr>
</thead>
</table>

**Example 5.3**

**Example 5.3 Source:**

CSS, Accessibility, and Images

In `style` element (`<style type="text/css">`) within `head` element:

- With Styles
- Without Styles

Phasellus varius tincidunt ligula. Praesent nisi. Duis sollicitudin. Donec dignissim, est vel auctor blandit, ante est laoreet neque, non pellentesque mauris turpis eu purus. 


In dolor urna, ullamcorper vel, tempor sit amet, semper ut, feils. Praesent nisi. 

Example 5.3 Rendered:
Layout, Take 2

header, footer, navigation, primary content, secondary content

Example 5.4

Example 5.4 Source:

```html
<style type="text/css">
/* This is the style element */
</style>
```

In style element (`<style type="text/css">`) within head element:
CSS Frameworks

- YUI CSS Grids and the YUI Grid Builder

The foundational YUI Grids CSS offers four preset page widths, six preset templates, and the ability to stack and nest subdivided regions of two, three, or four columns. The 4kb file provides over 1000 page layout combinations.

- 960 Grid System

The 960 Grid System is an effort to streamline web development workflow by providing commonly used dimensions, based on a width of 960 pixels. There are two variants: 12 and 16 columns, which can be used separately or in tandem.

- Blueprint

Blueprint is a CSS framework, which aims to cut down on your CSS development time. It gives you a solid CSS foundation to build your project on top of, with an easy-to-use grid, sensible typography, and even a stylesheet for printing.
YUI CSS Grid

- YUI CSS Grids and the YUI Grid Builder

The foundational YUI Grids CSS offers four preset page widths, six preset templates, and the ability to stack and nest subdivided regions of two, three, or four columns. The 4kb file provides over 1000 page layout combinations.
960 Grid System

The 960 Grid System is an effort to streamline web development workflow by providing commonly used dimensions, based on a width of 960 pixels. There are two variants: 12 and 16 columns, which can be used separately or in tandem.

```html
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>Lorem ipsum dolor sit</title>
    <meta http-equiv="Content-type" content="text/html; charset=utf-8"/>
    <link rel="stylesheet" type="text/css" media="all" href="http://morpheus.dce.harvard.edu/960gs/code/css/reset.css"/>
    <link rel="stylesheet" type="text/css" media="all" href="http://morpheus.dce.harvard.edu/960gs/code/css/text.css"/>
    <link rel="stylesheet" type="text/css" media="all" href="http://morpheus.dce.harvard.edu/960gs/code/css/960.css"/>
  </head>
  <body>
    <div class="container_12">
      <div class="grid_9">
        <!-- header -->
      </div>
      <div class="clear"></div>
      <div class="grid_2">
        <!-- navigation -->
      </div>
      <div class="grid_7">
        <div id="primary" class="grid_5 alpha">
          <!-- primary -->
        </div>
        <div id="secondary" class="grid_2 omega">
          <!-- secondary -->
        </div>
      </div>
      <div class="clear"></div>
      <div class="grid_9">
        <!-- footer -->
      </div>
    </div>
  </body>
</html>
```
Blueprint CSS

Blueprint is a CSS framework, which aims to cut down on your CSS development time. It gives you a solid CSS foundation to build your project on top of, with an easy-to-use grid, sensible typography, and even a stylesheet for printing.

Layout with Blueprint CSS

```html
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>Lorem ipsum dolor sit</title>
    <meta http-equiv="Content-type" content="text/html; charset=utf-8"/>
    <link rel="stylesheet" href="http://morpheus.dce.harvard.edu/blueprintcss/blueprint/screen.css" type="text/css" media="screen, projection"/>
    <link rel="stylesheet" href="http://morpheus.dce.harvard.edu/blueprintcss/blueprint/print.css" type="text/css" media="print"/>
    <!--[if IE]><link rel="stylesheet" href="http://morpheus.dce.harvard.edu/blueprintcss/blueprint/ie.css" type="text/css" media="screen, projection" /><![endif]-->
  </head>
  <body>
    <div class="container">
      <div id="header" class="span-24">
        <!-- header -->
      </div>
      <div class="span-4">
        <!-- navigation -->
      </div>
      <div class="span-15">
        <!-- primary -->
      </div>
      <div class="span-5 last">
        <!-- secondary -->
      </div>
      <div class="span-24">
        <!-- footer -->
      </div>
    </div>
  </body>
</html>
```
Harvard College Funding Database

Screen display (screen.css):

Print display (print.css):

CSS, Accessibility, and Images

media selector

CSS2 defines a media selector for different media types.

link

Incorporate as part of the "link" element:

@media selector

Or, use "@media" selector in style rule:

@media print {  
  body { font-size: 10pt; }  
  }  
@media screen {  
  body { font-size: 12pt; }  
  }  
@media print {  
  div.nav { display: none;  
  }  
  hr { page-break-after: always;  
  }  
}

media types

all  Suitable for all devices.

braille  Intended for braille tactile feedback devices.

embossed  Intended for paged braille printers.

handheld  Intended for handheld devices (typically small screen, limited bandwidth).

print  Intended for paged material and for documents viewed on screen in print preview mode.

projection  Intended for projected presentations, for example projectors.

screen  Intended primarily for color computer screens.

speech  Intended for speech synthesizers. Note: CSS2 had a similar media type called 'aural' for this purpose.

tty  Intended for media using a fixed-pitch character grid (such as teletypes, terminals, or portable devices with limited display capabilities).

tv  Intended for television-type devices (low resolution, color, limited-scrollability screens, sound available).
Print CSS

CSS Print Profile deals with paged media.

The book *Cascading Style Sheets: Designing for the Web (3rd Edition)* by Hakon Wium Lie and Bert Bos was printed using CSS.

See A List Apart: Articles: Printing a Book with CSS: Boom!

Recommendation and Implementations

Lists of CSS and Browser Compatibility:

- CSS Browser Support from westciv.com
- CSS Contents and Browser Compatibility from quirksmode.org
- Web Browser CSS Support from webdevout.net
**CSS "Hacks"**

- "Monkey Wrenches"
- Unsupported Selectors

**Resources**

- Tantek Çelik's CSS Examples
- CSS mastery: advanced web standards solutions by Andy Budd

"CSS Mastery" is available online from Harvard University Libraries.

Examples are used from Tantek Çelik's CSS Examples by permission under a Creative Commons License

**CSS only for "modern" browsers:**

```css
@import "null.css"; //
@import "for_current_browsers.css";
```

Modern browsers will import two CSS files: `null.css` and `for_current_browsers.css`

Older browsers (Windows IE <= 5.5; Mac IE <= 5; NS < 6) will interpret this statement as an import statement (null.css) followed by a style declaration with no selector.

**CSS only for old browsers:**

See the various "filter" mechanisms described in Tantek Çelik's CSS Examples

---

**Accessibility**

"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

Tim Berners-Lee, W3C Director and "inventor" of the World Wide Web

- W3C Web Accessibility Initiative (WAI)
  - WAI Resources on Introducing Web Accessibility
  - Web Content Accessibility Guidelines (WCAG)
    - WCAG 2.0 at a Glance
    - How to Meet WCAG 2.0
- United States Access Board: A Federal Agency Committed to Accessible Design
  - United States Government Section 508
  - Web-based Intranet and Internet Information and Applications (1194.22)
Web Content Accessibility Guidelines 2.0

- Four Principles
- 12 Guidelines
- Three levels of conformance

Summary of WCAG 2.0 from W3C WAI Web Accessibility Quicktips:

<table>
<thead>
<tr>
<th>Perceivable</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Provide text alternatives for non-text content.</td>
</tr>
<tr>
<td>- Provide captions and alternatives for audio and video content.</td>
</tr>
<tr>
<td>- Make content adaptable; and make it available to assistive technologies.</td>
</tr>
<tr>
<td>- Use sufficient contrast to make things easy to see and hear.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operable</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Make all functionality keyboard accessible.</td>
</tr>
<tr>
<td>- Give users enough time to read and use content.</td>
</tr>
<tr>
<td>- Do not use content that causes seizures.</td>
</tr>
<tr>
<td>- Help users navigate and find content.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understandable</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Make text readable and understandable.</td>
</tr>
<tr>
<td>- Make content appear and operate in predictable ways.</td>
</tr>
<tr>
<td>- Help users avoid and correct mistakes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Robust</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Maximize compatibility with current and future technologies.</td>
</tr>
</tbody>
</table>

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Accessibility Implementation

- Organizations
  - W3C WAI
  - Web Accessibility in Mind (WebAIM)

- Tools and Resources
  - Resource List: WAI Resources
  - Opera Browser: Using Opera to Check for Accessibility
  - Tool: WAVE from WebAIM
  - Tools: Turn Firefox into a screen reader
    - Fire Vox
    - Fangs
ready.gov

Operable: Help users navigate and find content.

Text View

Opera "Emulate text browser" view:

Two techniques:

Use links that have a negative margin
Image Replacement Techniques

- See "Web Design in a Nutshell" → Chapter 24, "CSS Techniques" → 24.5 "Image Replacement"
- Revised Image Replacement from mezzoblue shows 10 different techniques.

Use an image for the header of the page, but have a text equivalent.

Image is 50×900 px.

Leahy/Langridge Image Replacement (LIR)

- Set height to 0, overflow to hidden
- Set padding and have background image show through padding

Example 5.5

Example 5.5 Source:

```html
<h1 id="header1">
Harvard University Extension School
</h1>
```

Example 5.5 Rendered:

- With Styles
- Without Styles
The Rundle/Phark Technique

- Use a negative indent for text

**Example 5.6**

*Example 5.6 Source:*

```html
1. <h1 id="header2">Harvard University Extension School</h1>
```

In *style* element *(<style type="text/css">)* within *head* element:

```html
1. #header2 {
2.   height: 50px;
3.   background-image: url(images/dce_masthead.png);
4.   background-repeat: no-repeat;
5.   text-indent: -5000px;
6. }
```

**Example 5.6 Rendered:**

- With Styles
- Without Styles
Search Engine and Results Accessibility

Make your site ready for search engines

- well-formed (and hopefully valid) HTML/XHTML,
- use mark-up language for headings and lists
- titles that stand on their own
- "meta" keywords and description

Importance of a Good Title

Title is often seen outside of the context of the site.

- Browser
  - Bookmarks
  - History
  - Window Title
- Search Engine results
Search Engines

- title
- meta description
- meta keywords

Harvard University Admissions

The main website for the Harvard College Admissions Office which oversees undergraduate admissions for Harvard University.

O'Reilly ONLamp
In "head" element of page:

```html
<meta name="keywords" content="o'reilly network, o'reilly, onlamp.com, lamp, BSD DevCenter, Apache, PHP DevCenter, MySQL, o'reilly.com, oreilly, o'reilly" />
<meta name="description" content="Welcome to ONLamp.com, the high performance web development site from the O'Reilly Network offering comprehensive Lamp developer information and resources. ONLamp.com offers original articles, news and commentary." />
```
Two ways of including images:

- **Markup: `<img` element**
  - `alt` attribute
  - `height` and `width` attributes

```html
1. <img src="images/shield.png" alt="Harvard Shield, 'Veritas'" height="328" width="281"/>
```

- **CSS: `background-image` property**

```css
1. #header {
   background-image: url(images/shield.png);
   background-repeat: no-repeat;
}
```

### Graphics Tools

- **Adobe**
  - Adobe Photoshop
  - Adobe Fireworks
- **Corel**
  - CorelDRAW
  - Painter
  - Paint Shop Pro
- **Gimp**

### Graphics: Reminders about FTP and Unix

- Use **binary mode** when transferring graphic files via FTP.
- Remember that URL names (and Linux) is case-sensitive.
  - `image.GIF`
  - `image.gif`
Color Units

256 colors in each channel (Red, Green, Blue). Values can be

- decimal numbers (0 to 255)
  background-color: rgb(153,0,153);
- hexadecimal numbers (00 to ff)
  background-color: #990099;
- percentages (0 to 100%)
  background-color: rgb(60%,0%,60%);

Red-Green-Blue (RGB) Color

- RGB color is a 24-bit system (16 million colors)
- 8 bits (256 colors) for each channel (red, green, blue).

\[2^8 \times 2^8 \times 2^8 = 2^{(8 + 8 + 8)} = 2^{24} = 16,777,216\]

- Based on the properties of light not dyes

Each channel can be expressed as a number from 0 to 255.

- Specifying values:
  - Hexadecimal: #RRGGBB
    - RR is the hexadecimal value of the red channel
    - GG is the hexadecimal value of the green channel
    - BB is the hexadecimal value of the blue channel
  - Percentage (0% - 100%)
  - Number (0 - 255)

Color Depth

<table>
<thead>
<tr>
<th>Bits</th>
<th>Colors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2^1 = 2</td>
</tr>
<tr>
<td>2</td>
<td>2^2 = 4</td>
</tr>
<tr>
<td>3</td>
<td>2^3 = 8</td>
</tr>
<tr>
<td>4</td>
<td>2^4 = 16</td>
</tr>
<tr>
<td>5</td>
<td>2^5 = 32</td>
</tr>
<tr>
<td>6</td>
<td>2^6 = 64</td>
</tr>
<tr>
<td>7</td>
<td>2^7 = 128</td>
</tr>
<tr>
<td>8</td>
<td>2^8 = 256</td>
</tr>
<tr>
<td>16</td>
<td>2^16 = 65,536</td>
</tr>
<tr>
<td>24</td>
<td>2^{24} = 1.7 \times 10^8 (millions)</td>
</tr>
<tr>
<td>32</td>
<td>2^{32} = 4.3 \times 10^9</td>
</tr>
</tbody>
</table>
**Image and File Size**

Get an acceptable image in the least number of bytes possible.

- Overall Image Dimensions
- Format (GIF, JPEG, PNG)
- Compression

**Download Times**

- **Download Time Calculator**

How long to download 226 kb on a 56,000 bps ("56k") modem?

\[
226 \text{ kb} = 226 \text{ kb} \times 1024 \text{ bytes/kb} = 8 \text{ bits/byte} = 1,851,392 \text{ bits} \\
1,851,392 \text{ bits} / 56,000 \text{ bits/second} = 33 \text{ s}
\]

**Download Times for 83kb Page**
Vector Graphics and Bitmap Graphics

**Bitmap Graphic**
- Bitmap Graphic Formats on the Web
  - JPEG
  - GIF
  - PNG

Graphic type in which each pixel that comprises the image is described.
A 100 x 100 pixel bitmap image must encode information about 10,000 pixels.
A 200 x 200 pixel bitmap image must encode information about 40,000 pixels.

**Vector Graphic**
- Vector Graphic Formats on the Web
  - SWF (Flash)
  - SVG

Graphic type in which the image is described by a mathematical description.
Amount of information encoded is independent of the scale of image. For example, a circle is described by the equation
\[ x^2 + y^2 = r^2 \]
whether or not the radius is 5 pixels or 1000 pixels.
Graphics Formats for the Web

GIF
- Graphics Interchange Format
- Joint Photographic Experts Group
- Portable Network Graphic

JPEG

PNG

CSS, Accessibility, and Images

GIF

<table>
<thead>
<tr>
<th>Property</th>
<th>GIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color System</td>
<td>8 bit indexed (256 colors)</td>
</tr>
<tr>
<td>Compression</td>
<td>Lossless Compression (LZW, horizontal repeating units)</td>
</tr>
<tr>
<td>Other Features</td>
<td>.gif file extension, Transparency, Animation</td>
</tr>
<tr>
<td>Typical Uses</td>
<td>Illustrations (logos, icons), Animated banners and icons, Images with small dimension</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Photograph 250 × 188 px</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>29.3 kb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Illustration 148 × 179 px</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>1.47 kb</td>
</tr>
</tbody>
</table>
## JPEG

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color System</td>
<td>RGB (24 bit; millions of colors)</td>
</tr>
<tr>
<td>Compression</td>
<td>&quot;Lossy&quot; Compression (compression optimized for gradual color changes)</td>
</tr>
<tr>
<td>Other Features</td>
<td>- .jpg and .jpeg file extensions</td>
</tr>
<tr>
<td></td>
<td>- No Transparency</td>
</tr>
<tr>
<td></td>
<td>- No Animation</td>
</tr>
<tr>
<td>Typical Uses</td>
<td>- Photographs</td>
</tr>
</tbody>
</table>

### Photograph
- 250 × 188 px
- 16.8 kb

### Illustration
- 148 × 179 px
- 6.12 kb

## PNG

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color System</td>
<td>- 8 bit indexed (256 colors)</td>
</tr>
<tr>
<td></td>
<td>- RGB (24 bit; millions of colors)</td>
</tr>
<tr>
<td>Compression</td>
<td>Lossless Compression</td>
</tr>
<tr>
<td>Other Features</td>
<td>- .png file extension</td>
</tr>
<tr>
<td></td>
<td>- Transparency</td>
</tr>
<tr>
<td></td>
<td>- Animation through MNG extension</td>
</tr>
<tr>
<td>Typical Uses</td>
<td>- Any</td>
</tr>
</tbody>
</table>

### Photograph
- 250 × 188 px
- 25.8 kb (indexed, 8-bit)
- 81.9 kb (RGB, 24-bit)

### Illustration
- 148 × 179 px
- 1.02 kb (indexed, 8-bit)
- 1.89 kb (RGB, 24-bit)
### Graphics Formats for the Web

<table>
<thead>
<tr>
<th>Property</th>
<th>GIF Graphics Interchange Format</th>
<th>JPEG Joint Photographic Experts Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Color System</strong></td>
<td>8 bit indexed (256 colors)</td>
<td>8 bit indexed (2)</td>
</tr>
<tr>
<td></td>
<td>RGB (24 bit; millions of colors)</td>
<td>RGB (24 bit; millions of colors)</td>
</tr>
<tr>
<td><strong>Compression</strong></td>
<td>Lossless Compression (LZW; horizontal repeating units)</td>
<td>&quot;Lossy&quot; Compression (compression optimized for gradual color changes)</td>
</tr>
<tr>
<td><strong>Other Features</strong></td>
<td>.gif file extension</td>
<td>.jpg and .jpeg file extensions</td>
</tr>
<tr>
<td></td>
<td>Transparency</td>
<td>No Transparency</td>
</tr>
<tr>
<td></td>
<td>Animation</td>
<td>No Animation</td>
</tr>
<tr>
<td><strong>Typical Uses</strong></td>
<td>Illustrations (logos, icons)</td>
<td>Photographs</td>
</tr>
<tr>
<td></td>
<td>Animated banners and icons</td>
<td>Any</td>
</tr>
<tr>
<td></td>
<td>Images with small dimension</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>GIF Graphics Interchange Format</th>
<th>JPEG Joint Photographic Experts Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Photograph</strong></td>
<td>250 × 188 px 29.3 kb</td>
<td>16.8 kb 25.8 kb (indexed, 8-bit)</td>
</tr>
<tr>
<td><strong>Illustration</strong></td>
<td>148 × 179 px 1.47 kb</td>
<td>6.12 kb 1.02 kb (indexed, 8-bit)</td>
</tr>
</tbody>
</table>

*Illustration image from the original works of David Heitmeyer*
Palettes

- Exact (if 256 or fewer colors)
- Adaptive (weighted based upon colors in document)
- Web Palette (216 Web Safe Colors)
- System
  - Windows
  - Macintosh

Palettes: Exact, Adaptive, Web 216

Exact Palette

Adaptive Palette

Web 216 Palette
Adaptive Palette: Shift and Dither

Color Shift

Image (16 colors; Color Shift)

Zoom

Dither

Image (16 colors; Dither)

Zoom
GIF Images and Bit Depth: Color Shift

- **8 bit**
  - 256 colors
  - 46.3 kb

- **7 bit**
  - 128 colors
  - 36.2 kb

- **6 bit**
  - 64 colors
  - 28.9 kb

- **5 bit**
  - 32 colors
  - 21.9 kb

- **4 bit**
  - 16 colors
  - 16.5 kb

- **3 bit**
  - 8 colors
  - 10.9 kb
GIF Images and Bit Depth: Dither

Properties

- 8 bit
- 256 colors
- 64.9 kb

- 7 bit
- 128 colors
- 52.3 kb

- 6 bit
- 64 colors
- 43.4 kb
Compression for Indexed GIF and PNG

GIF LZW compression operates on horizontal blocks of the same color. Here are two images that are identical except for a 90 degree rotation. The vertical stripe GIF image is nearly twice as large as the horizontal stripe GIF image. The PNG images are the same size.

<table>
<thead>
<tr>
<th>Format</th>
<th>Horizontal Stripes</th>
<th>Vertical Stripes</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIF</td>
<td>471 bytes</td>
<td>911 bytes</td>
</tr>
<tr>
<td>PNG</td>
<td>232 bytes</td>
<td>221 bytes</td>
</tr>
</tbody>
</table>

Compression and Dithering

A purple shade was created by alternating red and blue pixels. 32× magnification:

<table>
<thead>
<tr>
<th>Image Format</th>
<th>Dithered Grid</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIF</td>
<td>601 bytes</td>
<td>303 bytes</td>
</tr>
<tr>
<td>PNG</td>
<td>225 bytes</td>
<td>209 bytes</td>
</tr>
</tbody>
</table>
The amount of compression (quality of image) for a JPEG image can be chosen (from a scale of 0 to 100). The image quality is inversely related to the amount of compression since the compression algorithm is "lossy".

<table>
<thead>
<tr>
<th>Quality</th>
<th>Image Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>34.1 kb</td>
</tr>
<tr>
<td>70</td>
<td>26.0 kb</td>
</tr>
<tr>
<td>60</td>
<td>22.4 kb</td>
</tr>
<tr>
<td>50</td>
<td>17.0 kb</td>
</tr>
<tr>
<td>40</td>
<td>14.3 kb</td>
</tr>
<tr>
<td>30</td>
<td>6.97 kb</td>
</tr>
</tbody>
</table>
JPEG Compression Artifacts

Typically first appears at boundaries in images. Portions of image can also become "blocky".

Schlering at boundaries:

Blockyness
### Aliased and Anti-aliased Text

<table>
<thead>
<tr>
<th>Format</th>
<th>Aliased</th>
<th>Anti-aliased</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIF</td>
<td>0.79 kb</td>
<td>1.9 kb</td>
</tr>
<tr>
<td>PNG (indexed)</td>
<td>0.62 kb</td>
<td>1.7 kb</td>
</tr>
<tr>
<td>PNG (24-bit)</td>
<td>1.12 kb</td>
<td>2.6 kb</td>
</tr>
<tr>
<td>JPEG</td>
<td>5.5 kb</td>
<td>4.9 kb</td>
</tr>
</tbody>
</table>

JPEG Compression artifacts:

**When in the course of human events...**  When in the course of human events...
Animation: GIF

Aside: Banner Advertisements

The Interactive Advertising Bureau (IAB) has established guidelines for sizes of banner ads (interactive marketing units; IMUs)
A common size is 728 x 90 pixels:
Transparency

With GIF and PNG images, a color in the palette can be designated as "transparent". This lets any background colors or background images show through the transparent portions.

<table>
<thead>
<tr>
<th>Format</th>
<th>Background Color</th>
<th>Background Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIF</td>
<td>(gray)</td>
<td>satin.png</td>
</tr>
<tr>
<td>GIF</td>
<td>No transparency</td>
<td></td>
</tr>
<tr>
<td>GIF</td>
<td>White is transparent</td>
<td></td>
</tr>
<tr>
<td>GIF</td>
<td>Blue is transparent</td>
<td></td>
</tr>
</tbody>
</table>
Linking with Images: Imagemaps

- Image itself. `usemap` attribute for `img`
- Definition of "hot spots" for image. `map` element
  - `area` element
    - attributes
      - `shape="circle"`
      - `shape="rect"`
      - `shape="poly"`
      - `coords`

Imagemap Example

Example 5.7

Example 5.7 Source:

```html
Example 5.7 Source:
1. <img src="images/shapes.gif" width="192" height="39" usemap="#shapes" alt="Shapes" style=""
2. <!-- map for shapes image -->
3. <map id="shapes" name="shapes" >
4. <area shape="circle" coords="106,18,17" href="http://en.wikipedia.org/wiki/Circle" alt="Circle" />
5. <area shape="rect" coords="1,4,60,32" href="http://en.wikipedia.org/wiki/Rectangle" alt="Rectangle" />
6. <area shape="poly" coords="150,34,190,34,170,0" href="http://en.wikipedia.org/wiki/Triangle" alt="Triangle" />
7. </map>
```

Example 5.7 Rendered:

- Units are in Pixels, (0,0) is the upper left corner of the image.
- Circle: center (106, 18); radius = 17
- Rectangle: vertices at (1,4), (60,4), (1,32), (60,32)
- Triangle: vertices at (170,0), (150,32), (190,32)
Exploring Vermont's Regions @VermontVacation.com
Site Icons: Favicon

- `favicon.ico` at root of web site
- "link" element in "head" element of XHTML/HTML document

The code in the `head` of the XHTML would look something like:

```html
1. <!-- for mozilla/firefox -->
   <link rel="icon" href="images/mozilla-16.png" type="image/png"/>
2. <!-- for IE -->
   <link rel="shortcut icon" href="images/mozilla.ico" type="image/vnd.microsoft.icon"/>
```

**Formats and Settings:**

- Microsoft's ICO format (image/vnd.microsoft.icon)
- PNG
- GIF
- Size and Colors: typically 16×16 (can be 32×32) with 8-bit color (256 colors)

---

Image Formats We Haven't Discussed

**Vector** formats that are relevant to web development.

- Adobe Flash/SWF
- Scalable Vector Graphics (SVG)

**Other Bitmap** formats typically not encountered in web development.

- TIFF (Tagged Image File Format)
- JPEG 2000