Week 4

- **IMAGE OPTIMIZATION**:
- Optimizing techniques:
  1) file formats: choose jpg or gif
  2) compression: compress the image data
  3) colour resolution: # of colours used (24 bits, 16 bits, 8 bits)
-
- *File format*

  _Choose a file format appropriate for web: gif, jpg, png, NOT tiff, bmp, psd

  - GIF properties
    - Graphics interchange format
    - Common image format used on internet
    - Supports a max of 8- bit colour scheme
    - Best for large areas of solid, flat colour
      _uses: illustrations, logos, text as graphics, cartoons, buttons
    - Tiny file sizes in comparison with .jpg
    - Saving an image with 44 bit colour (jpg)→ (gif) as a gif will lower the quality of the 1st time you convert it to a gif
    - SUMMARY: smaller file size & max of 256 colours
    - Allows for animation
    - Don't need a plug in for gif animation
    - Works in all browsers, universal fomart
      _lacks sounds?

  - JPG, .JPEG
    - Joint Photographic Experts Group
    - JPEG stores full colour info:
      _supports max of 24 bits (pixel 2^24= 16 million colours)
    - Good for photos computer games, screenshots, still from a movie, etc
    - Best for blends of colour, softer shadow effects, subtle changes in colour
    - Not for well-defined lines or shape contrasts between colours
    - Larger file size in comparison with .gif (because of bit depth 2^24)

  - Jpg- distorts the edges where there's sharp contrats
  - Gif- large areas of solid file format

- *Compression*
  _choose a compression technique appropriate for the web
  - Role of compression is to:

- Reduce the redundancy of the image data in order to be able to store or transmit data in efficient form
- Compression as much as you can WITHOUT sacrificing Quality (by losing bits info)

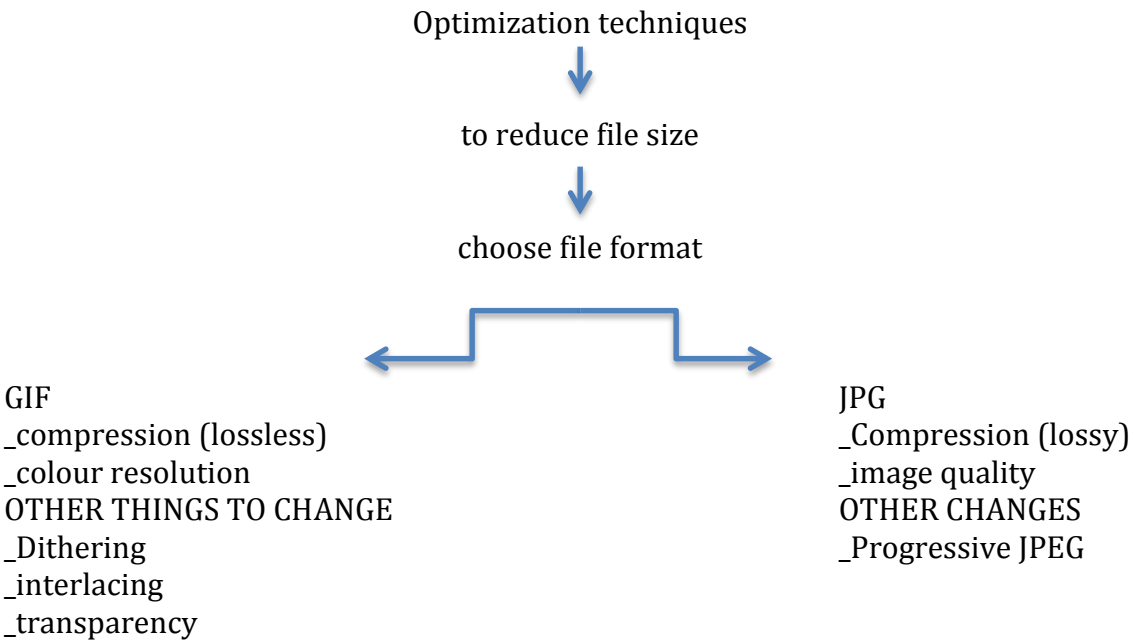
- Lossless

  _every time you File> save, compression can be controlled
  - Compress the original bits & bytes into less bits & bytes without losing any of the original info about the IMAGE
  - When we reopen the file, all the original info about the picture is still there!
  - No info is lost
  - .GIF: "lOSSLESS" compression
    _ no data is discarded during compression
    _QUALITY IS KEPT

- Lossy

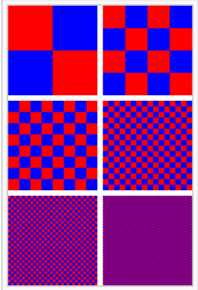
  _every time you File>save, YOU CAN CONTROL COMPRESSION
  - When compression occurs, some of original info is LOST
  - .JPG: "LOSSY" compression

_lossless: no loss (all data is there)
_lossy: certain amount of loss



GIF→ Transparency
GIF→ Animation
GIF→ Dithering

- Juxtaposing (place side by side) pixel of 2 colours to create the illusion that a 3rd colour is present (grainy look)
- can lower download time
- most common method to reducing colours
- can reduce # of colours in a GIF & choose options to control # of colours and % of dithering (in Photoshop)



An illustration of dithering. Red and blue are the only colors used, but as the pixels become smaller, the patch appears violet.

GIF→ Interlacing

- how images are downloaded to the screen
- process by which the image is drawn in a series of passes rather than all at once
- best when image file sizes are really big
  _BENEFITS: lets you have a feel for the whole picture, no need to wait around to see it download (good for dial up connections)

	GIF	JPG	PNG-8	PNG-24
Supports	8 bit color	24 bit color	8 bit color	24 bit
Best For	Logos, Cartoons, Drawings	Photographs	Logos, Cartoons, Drawings	Photograph Images with a need for transparency
Type of Compression	Lossless	Lossy	Lossless	Lossless
Well Supported in Browsers	All	All	All	Not on IE6
Transparency	One COLOUR only	NO	One COLOUR only	TRANSLUCENCY Varying levels of opacity and transparency
Animation	Yes	No	No	No
Dithering	Yes	No	Yes	No
Interlacing	Yes	No (progressive)	Yes	Yes

Questions:

1) how big will an image be in terms of bytes if its uncompressed, true colour and 200 by 400 bytes? 200*400= 80,000 bytes
2) what type of compression doesn't lose any of the orginal info about the image? Lossless
3) white type(s) of file formats perform a lossless compression? GIF
4) JPGs will produce a smaller file size than PNG24 for photograph: true

Browser Safe Palette: A color table containing only 216 out of a possible 256 colors, used to precisely match the colors of graphics and pictures in cross-platform Web browsers.

Capturing Digital Images

Scanning:

- Samples on scanners measured as dots per inch (dpi)
  - you specify this value: 100 dpi, 300 dpi, 600 dpi, etc
- if we scan, print size will be: 3600x2400 pixels
  formula: physical image size is dependent on print size dimension(in inches) =pixel dimensions/ print resolution