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Learning about the file formats, their differences, and when to use which ...

# Web Image Preparation

So, what is a web graphic,  
and why is it different from other pictures?



A web graphic is a lightweight image file that is optimized for use on the web ... meaning:

- ▶ it has a resolution targeted for screen output (72ppi),
- ▶ it is saved to balance the quality of the image with the file size so that it doesn't take too long to load into web pages across networks.

## Most common types of web graphics:

- jpg
- gif
- png-8
- png-24
- png-32
- svg

These are the ones we will discuss.





First, let's address the jpg, which stands for Joint Photographic Experts Group (also .jpeg).

- ➔ color mode: RGB or Grayscale
- ➔ compressed format
- ➔ supports millions of colors
- ➔ good for photographic imagery
- ➔ does not support transparency







The way a jpg works is that it compresses the file to make it smaller during transfer, and it is expanded again when it is viewed ... very much like an accordion.

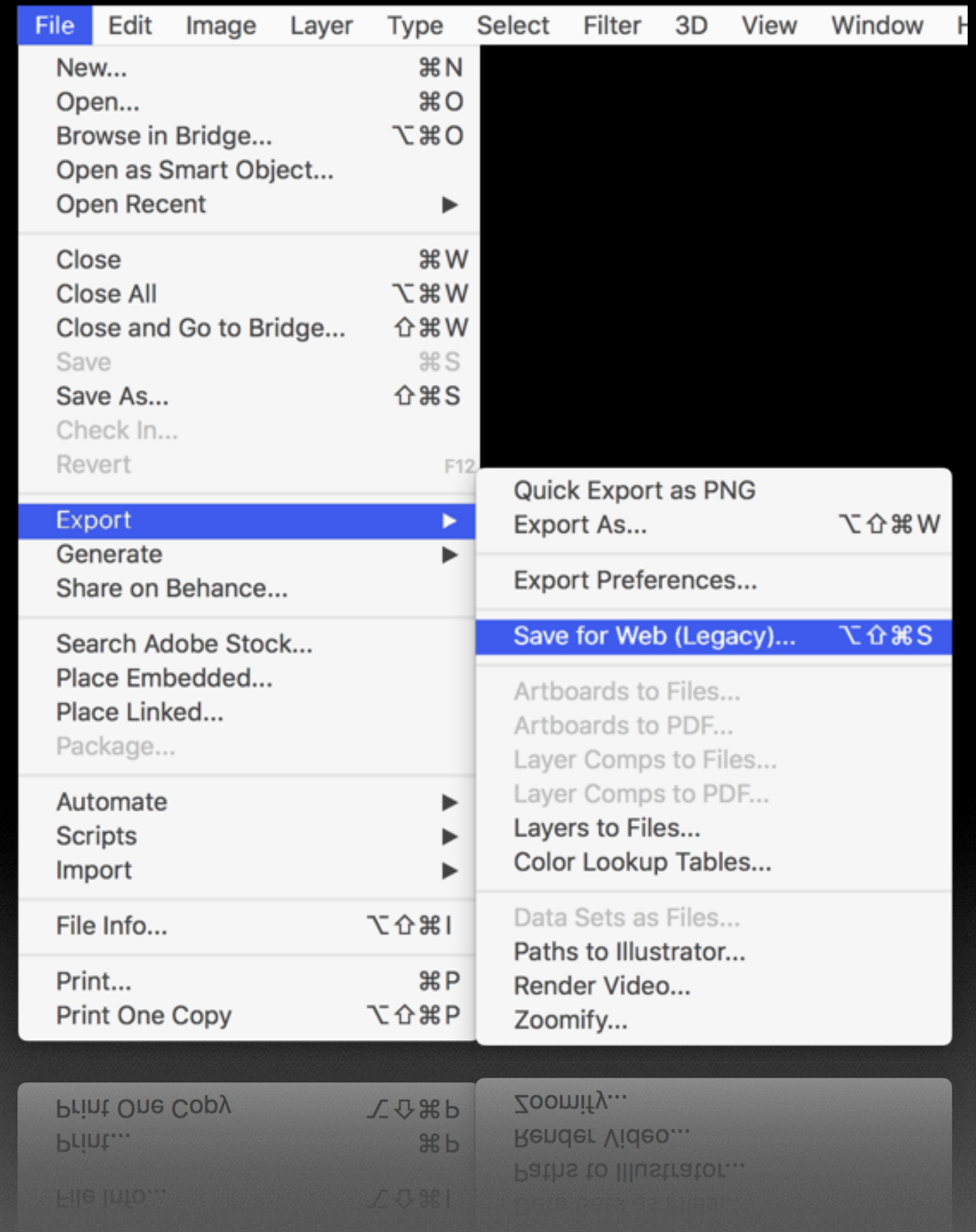
The compression process throws selected data away so that it can get smaller, leaving holes in the file whose pixels are later reinvented based on the colors surrounding the holes. This "reinvention" of approximated data is called interpolation.







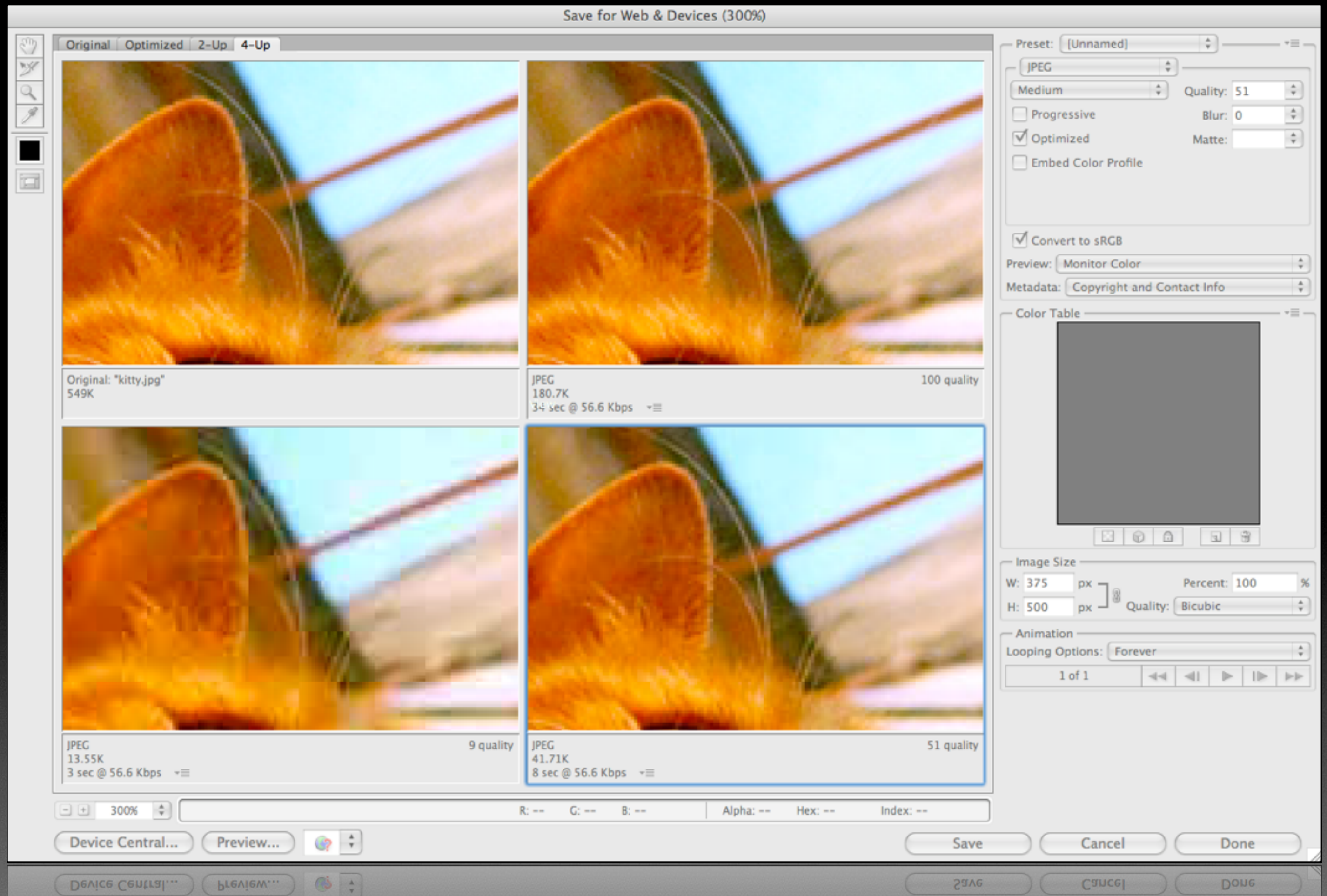
Thus, the higher rate of compression you select, the lower the quality the image will be (although the file size will be smaller). Even though Photoshop is moving away from the legacy "Save for Web" menu option, it is still useful in understanding how different images work. You can use it to compare quality, file type, and file size before outputting the final image (among other things) ...







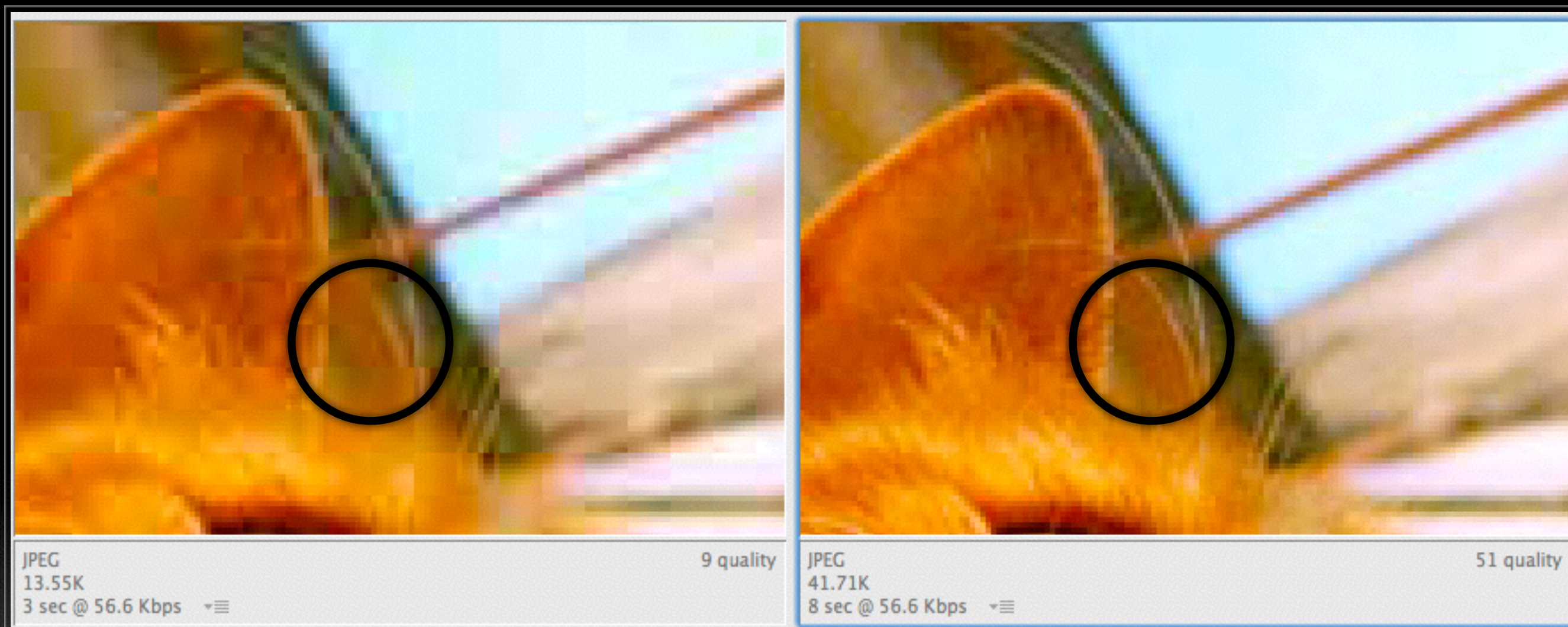
Here's the 4-Up saving screen for optimized Photoshop images:







Notice the compression differences between the low 9% quality image on the left and the 51% quality image on the right:



The left side is having to “make up” a lot more pixel information than the right side, so it has more “artifacts.” Artifacts are the areas in a jpg that are “interpolated,” or recreated on a best estimate of what should be there.



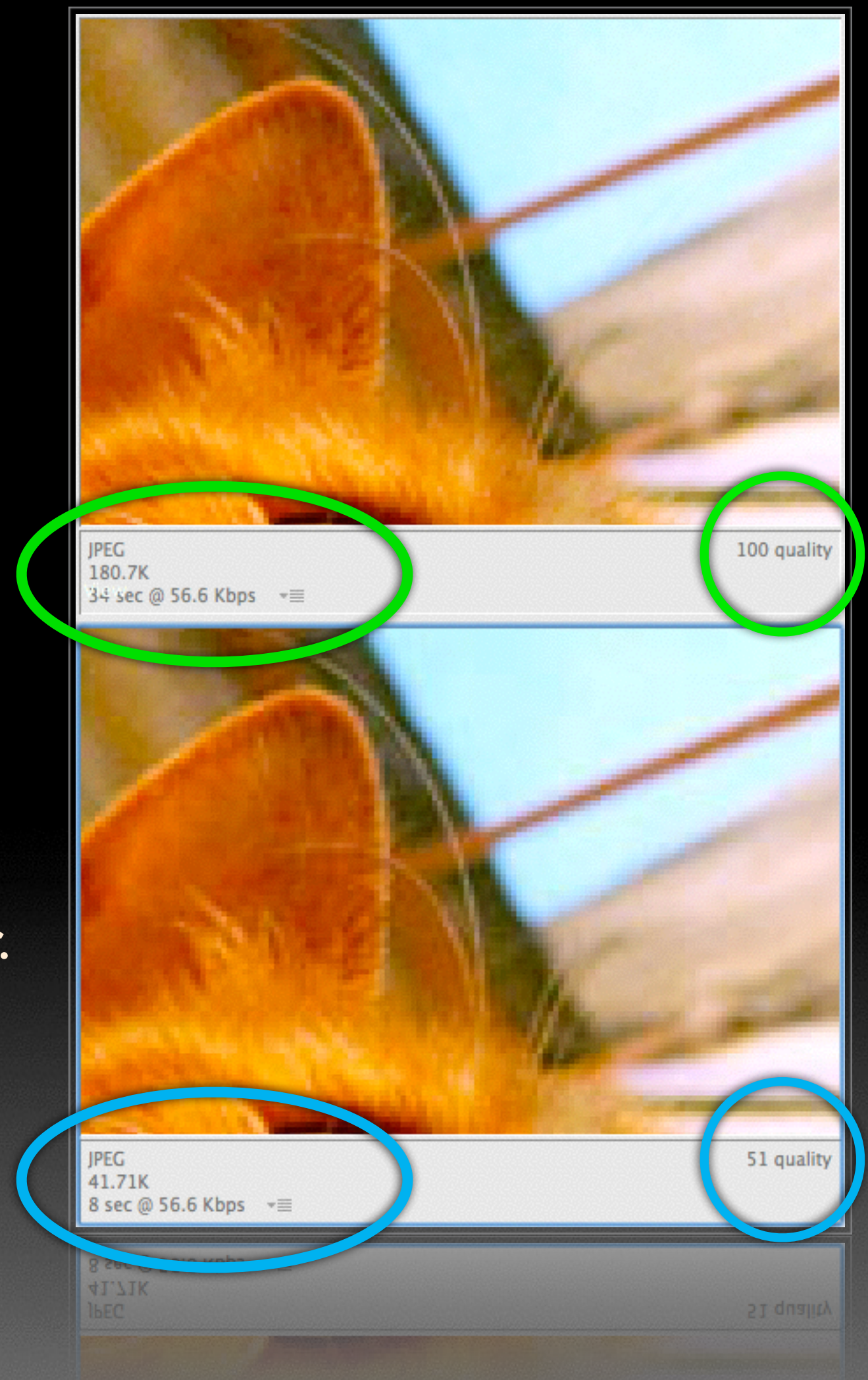


Before continuing, it is important to know that this image is currently zoomed in at 300% of the actually size.

The top box has these specs:  
jpeg, 180.7 kilobytes, 100% quality

The bottom box has these specs:  
jpeg, 41.7 kilobytes, 51% quality

The bottom graphic will be more than 3x smaller in file size, so it will load much faster. What we really need to know now is if we can live with the difference in quality when we view it as 100% of the image's normal size. Let's take a look ...







Depending on what you doing with the picture, the lower-quality image might be just fine. The differences are hardly perceptible at 100%. And the file size is so much smaller!

Be aware, though, that some people like to use the browser ZOOM feature, which will also zoom your images. No matter how good the original picture is, zoom will always “fuzz it out” some, but the effect will be dramatically reduced if your image starts out with fewer artifacts.







As a recap, the good, bad, and the ugly regarding jpg images:

### Advantages:

- ✓ better color range than most other web graphic file types
- ✓ reasonable file sizes available most of the time

### Disadvantages:

- transparency not available
- pixelated look with high compression
- potentially large file size for some image types







Now, let's address the gif, which stands for Graphic Interchange File. It was invented by the CompuServe company.

- ➔ color mode: Indexed Color
- ➔ primarily used for logo or text graphics that don't need a full tonal range
- ➔ supports basic transparency (removal of colored pixels)
- ➔ "dithers" to approximate colors not in its palette
- ➔ You can have animated sequences in a standard gif file

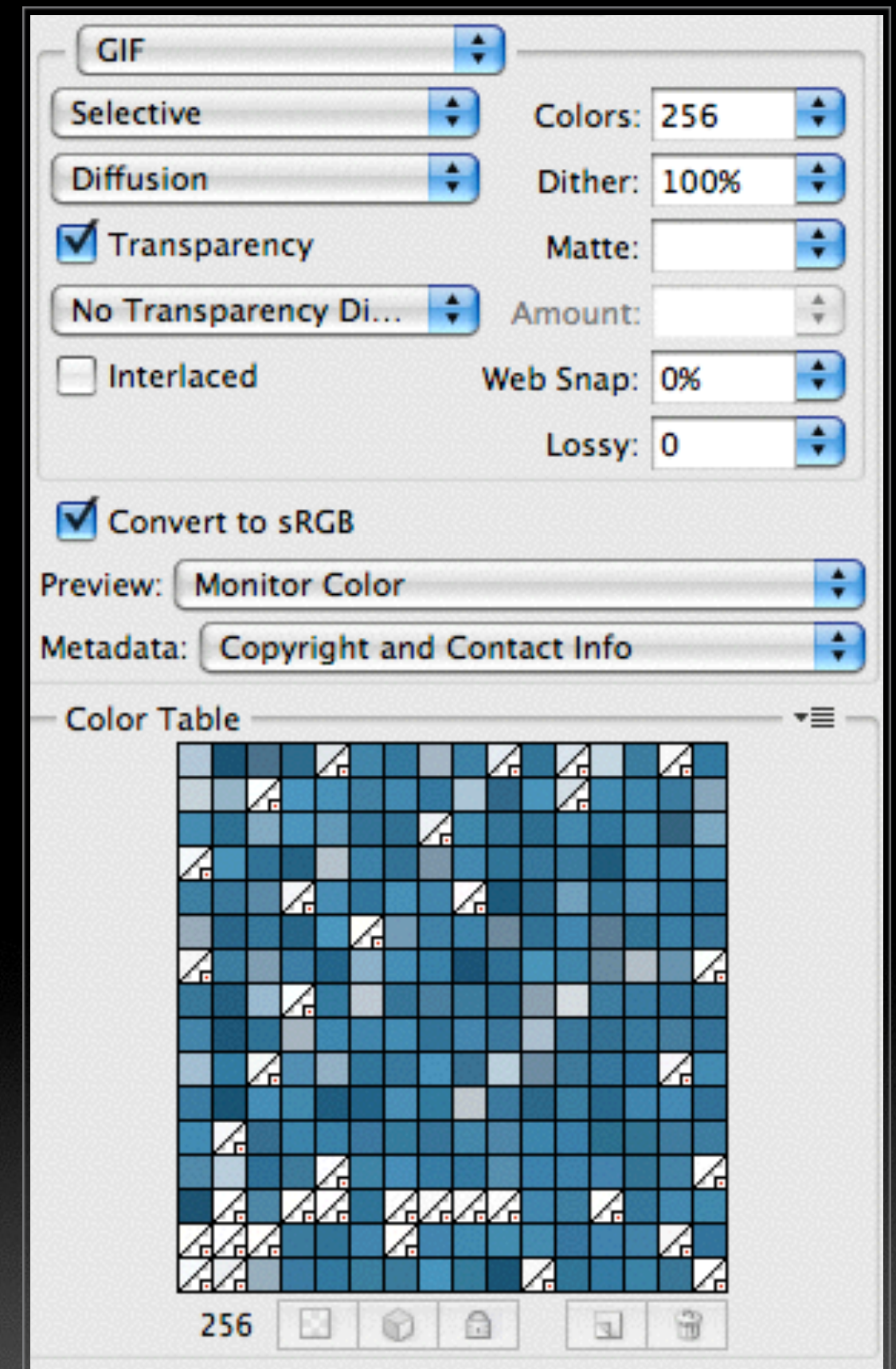






Okay, so what does “Indexed Color” mean?

- ➔ Indexed color is literally a limited and predefined palette of up to 256 colors from which a file can choose its values (as seen on the right).
- ➔ It differs from RGB color mode in that RGB has three color channels to build its color selection: Red, Green, Blue. Each channel is capable of up to 256 tones.
- ➔ Because Indexed Color files have only one channel, they are usually smaller.



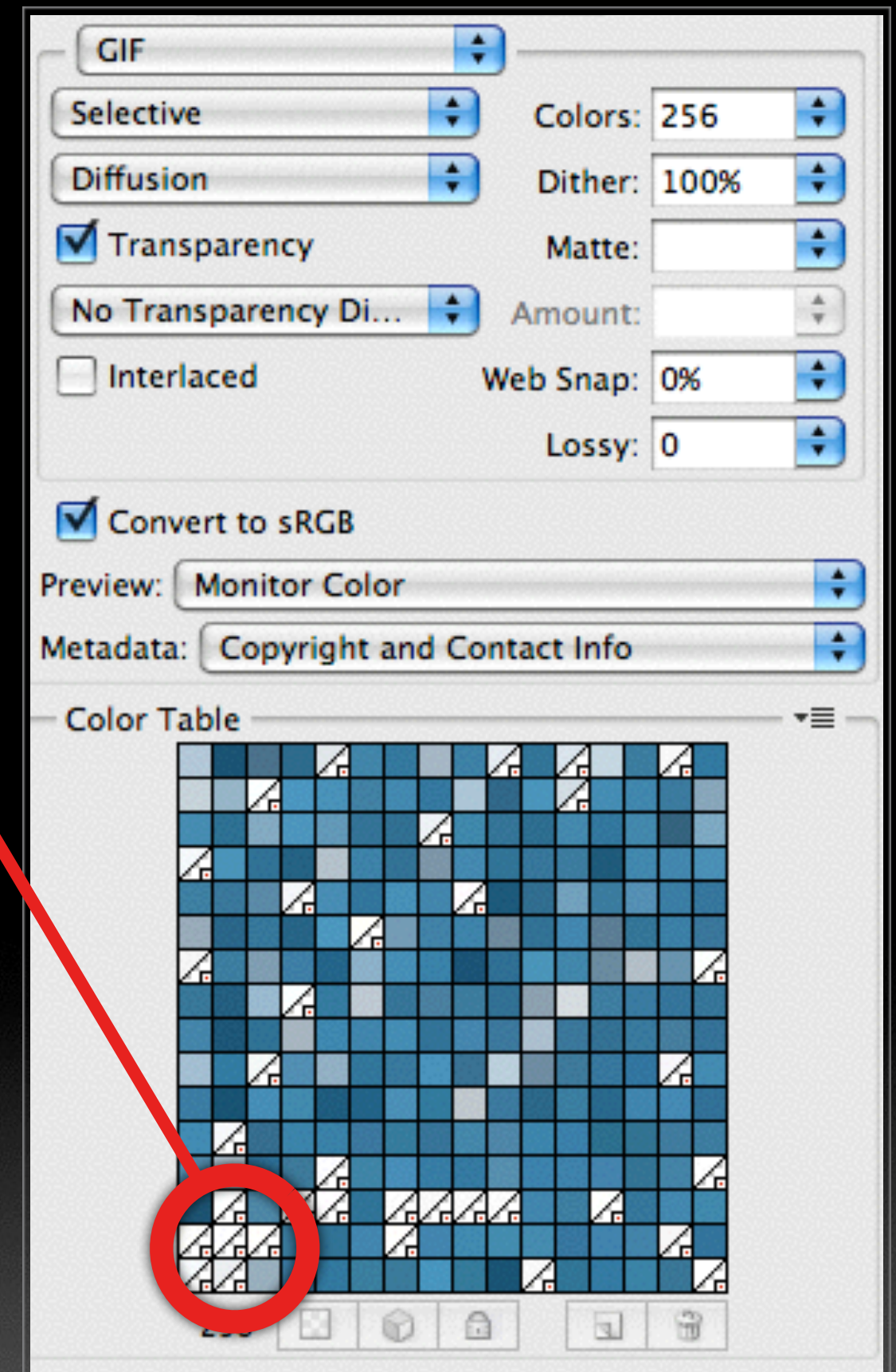




Remember how we said gifs can support transparency by knocking out selected colors from the palette?

On the right is an example of values that have been removed from our selection of colors.

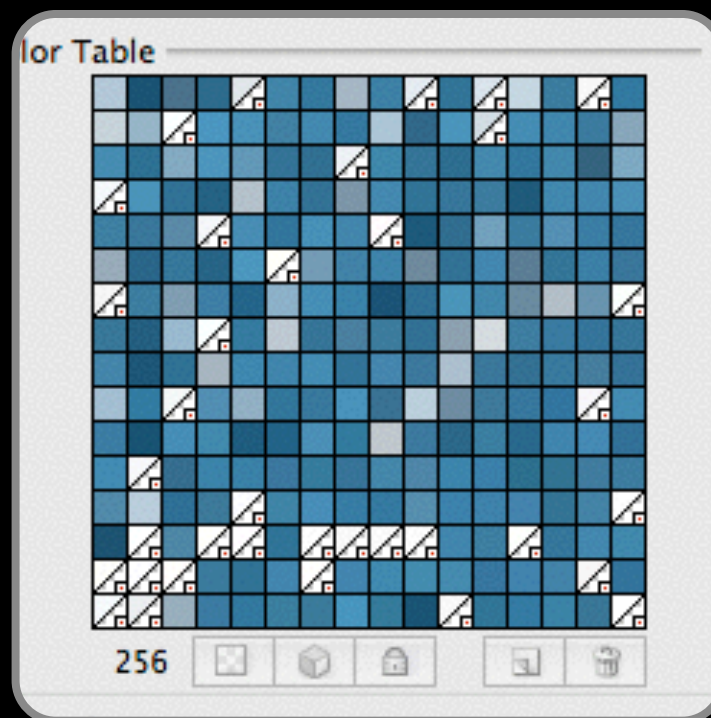
One of the problems with using standard gif files for transparency, however, is that it is hard to knock out all the colors necessary to have the image seamlessly float on top of a contrasting background. Let's look at the next slide to see an example ...







On top of a contrasting  
background ... bleck!

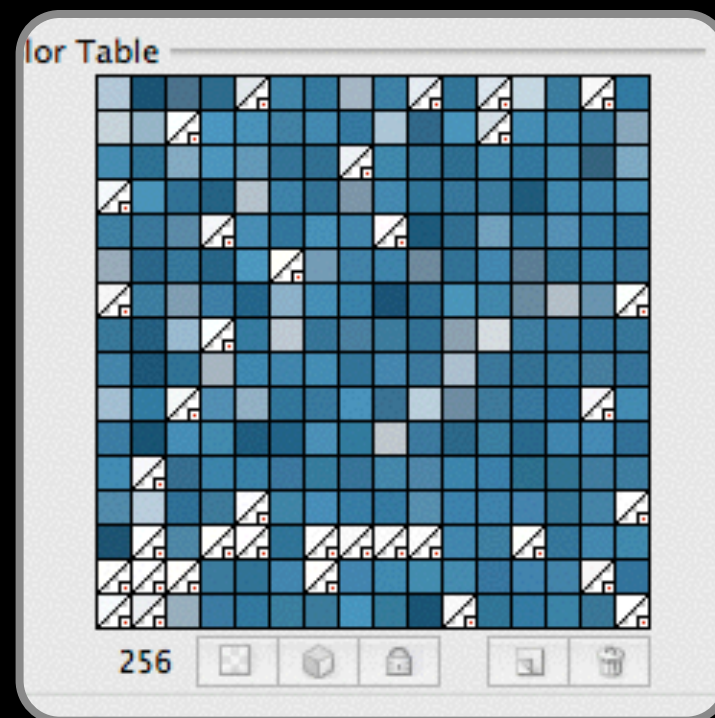


The transparency  
"Color Table" used



On top of a similar  
background ... not bad.





So you may ask why we might want to use a transparent gif file instead of a png-32 if png-32 files are so much more superior.

The reasons:

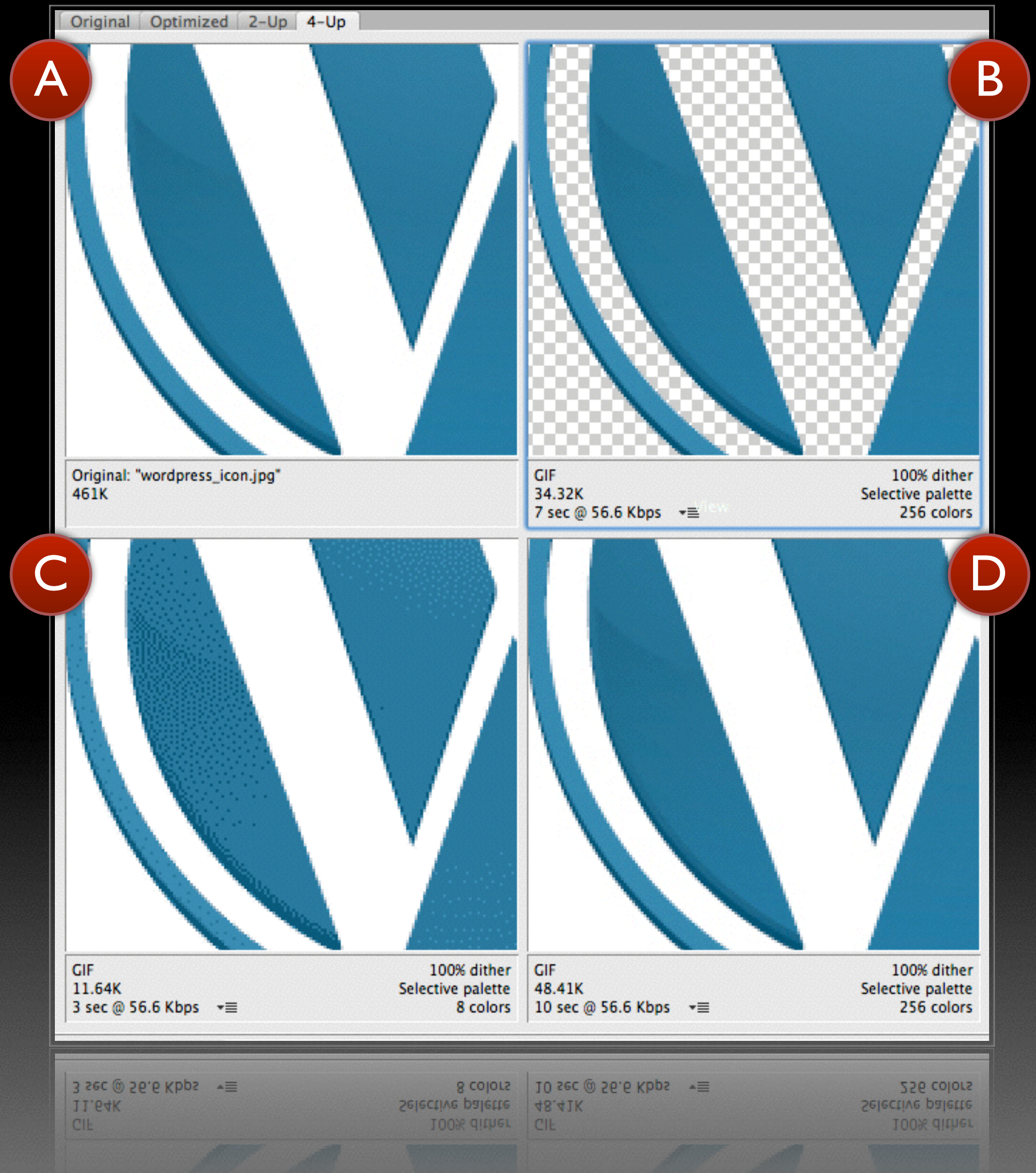
- \* The gif file above is about 35kb, where the png-32 version is ~100kb. If you know the logo will always float over a compatible color, then why not use a smaller graphic?





## The Photoshop Web Optimization Screen

- A** Original image
- B** Transparent GIF
- C** Dithered GIF, max colors = 8
- D** Dithered GIF, max colors = 256







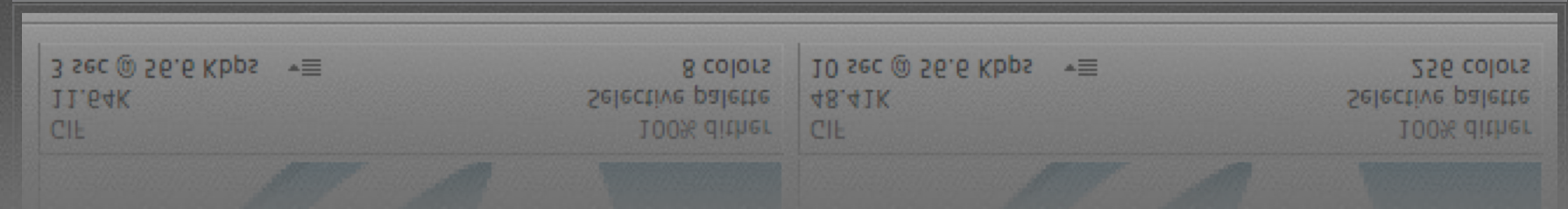
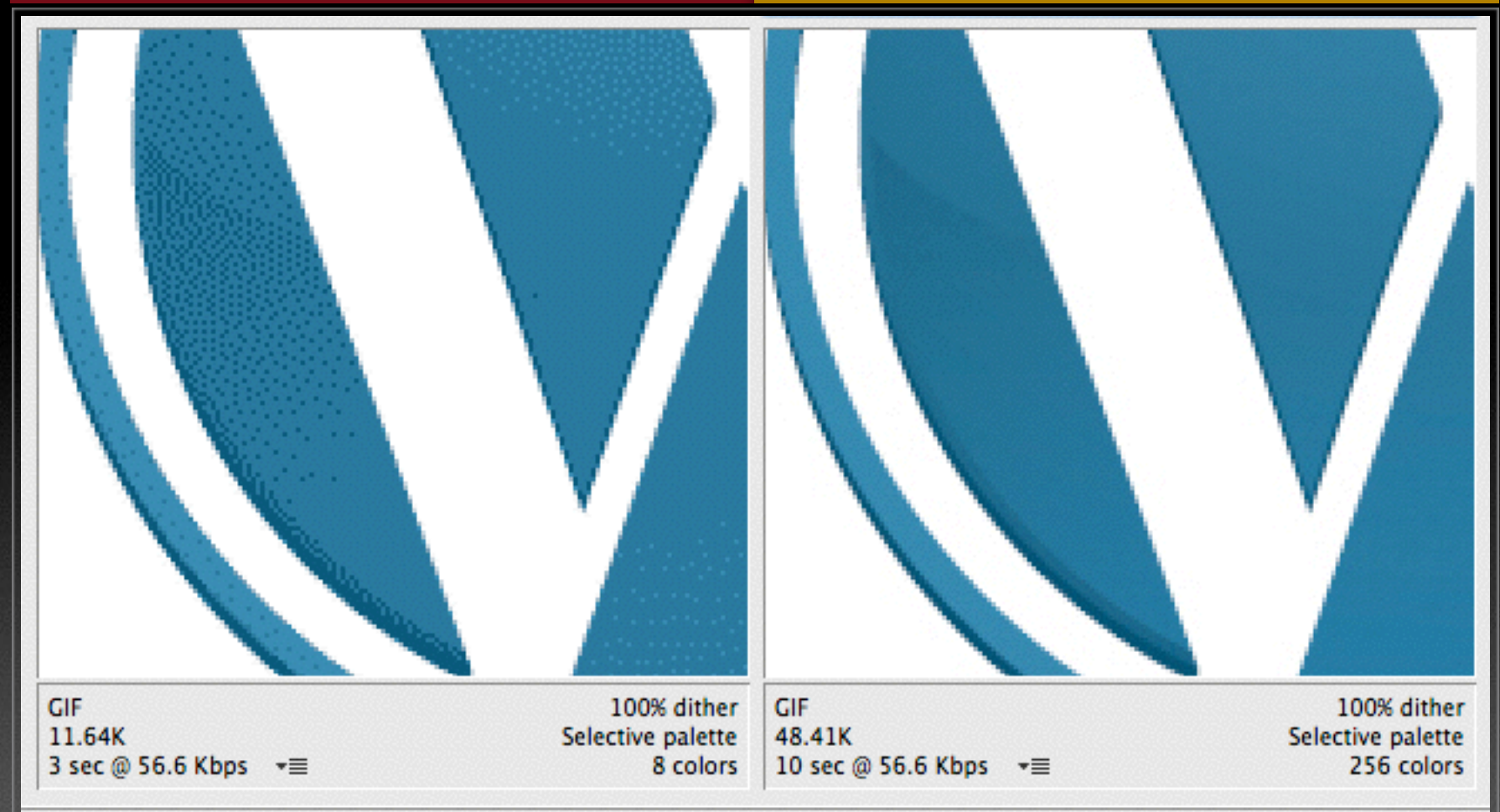
## About Dithering

Notice how the left and right images are different although they are both dithered. That is because the right side has more colors to choose from its palette.

**Dithering** works on the art concept of “**visual blending**,” where you put two colors adjacent to each other to get the effect of a third color.

Dithered GIF,  
max colors = 8

Dithered GIF,  
max colors = 256

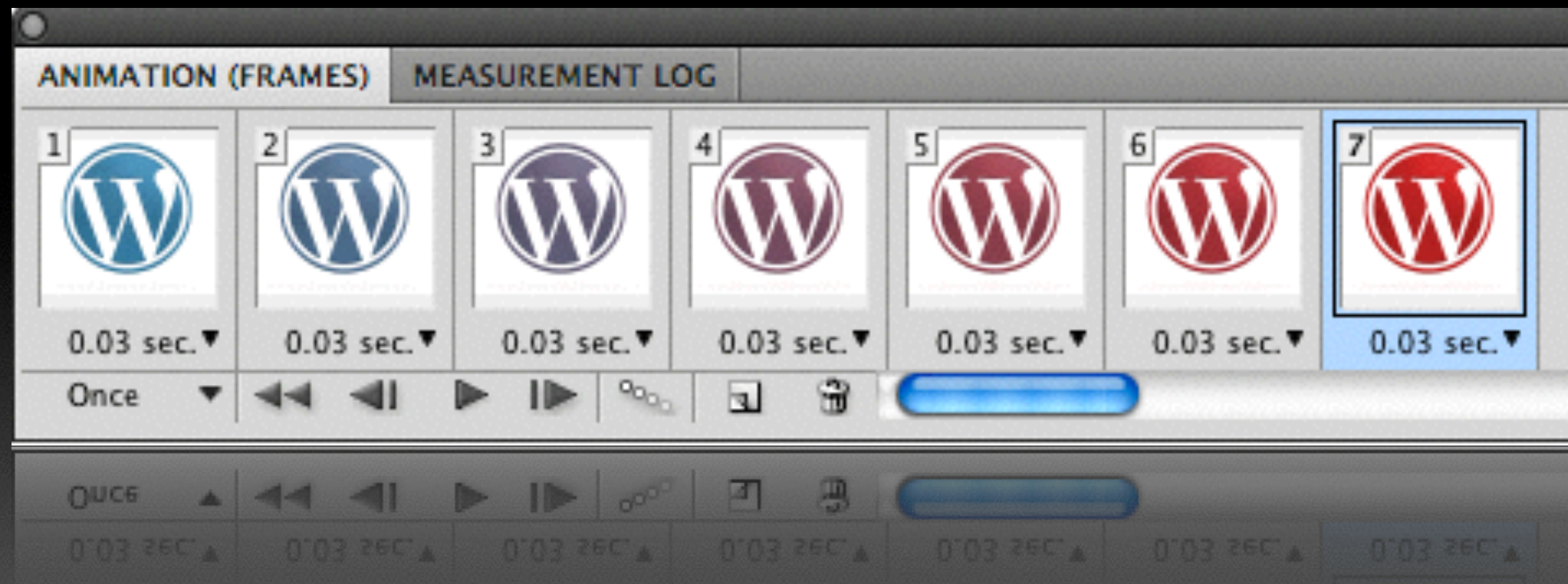






## Animated GIFs

You can also create frame sequences with gif files to create simple animations. For instance, here's the animation panel from Photoshop so you can see how our same “W” graphic can morph from blue to red. When you create animated GIFs, you can make them run once or loop.







As a recap, the good, bad, and the ugly regarding gif images:

### Advantages:

- ✓ small file size
- ✓ can store animation sequences within the graphic file
- ✓ supports transparency

### Disadvantages:

- generally poor choice for full tonal range images
- transparency is not as good as in png-32





# PNG-8

PNG stands for Portable Network Graphic.

- ➔ color mode: Indexed Color
- ➔ primarily used for logo or text graphics that don't need a full tonal range
- ➔ supports basic transparency (removal of colored pixels)
- ➔ "dithers" to approximate colors not in its palette





# PNG-8

Did those descriptions seem familiar?  
That's because the MAIN difference  
between a PNG-8 and GIF file is that  
PNG-8 files do not support animation  
sequences.

In fact, that's all we'll say about them to  
be brief!





# PNG-24 and PNG-32

Portable Network Graphic -  
24 bits and 32 bits

- color mode: RGB or Grayscale
- RGB = 8bits, 8bits, 8bits = "24"
- Doesn't support lossless compression like jpgs, so file sizes are much bigger
- supports millions of colors
- good for photographic imagery
- **DOES** support transparency as a "32"-bit file (RGB+Alpha)





# PNG-24 and PNG-32

## Portable Network Graphic - 24

Basically, the PNG-24 / 32 file was made to bridge the gap between jpg and gif files. It has millions of colors like a jpg, but the 32-bit version supports transparency in an 'alpha' layer. Because the color range is so great and the alpha is more sophisticated, the transparency is soft and realistic and can float on top of other images seamlessly, like you see here.





# PNG-24 and PNG-32

## Portable Network Graphic - 24

The “24” comes from the fact that it is an RGB Color Mode, having 3 channels that are each 8 bits. The PNG-8, however, is named with an “8” because it has only one channel for indexed color (or 8 bits).

## Portable Network Graphic - 32

The “32” is RGB + an 8-bit Alpha transparency channel.





# SVG

SVG stands for Scalable Vector Graphic.

- uses embedded xml to draw image with vectors instead of pixels
- primarily used for 2-D line art (icon, logo, or text graphics)
- supports transparency
- modern browsers now have good SVG support, and they are safe to use.





# SVG

SVGs are great because:

- ➔ they are VERY lightweight
- ➔ they scale without degradation
- ➔ they support transparency





# SVG

## More information on SVGs:

- ➔ they were created in 1999
- ➔ some VERY GOOD LINKS on SVGs:
  - ➔ <http://caniuse.com/svg> (list of browser support)
  - ➔ <http://css-tricks.com/using-svg/> (details methods of use)

