

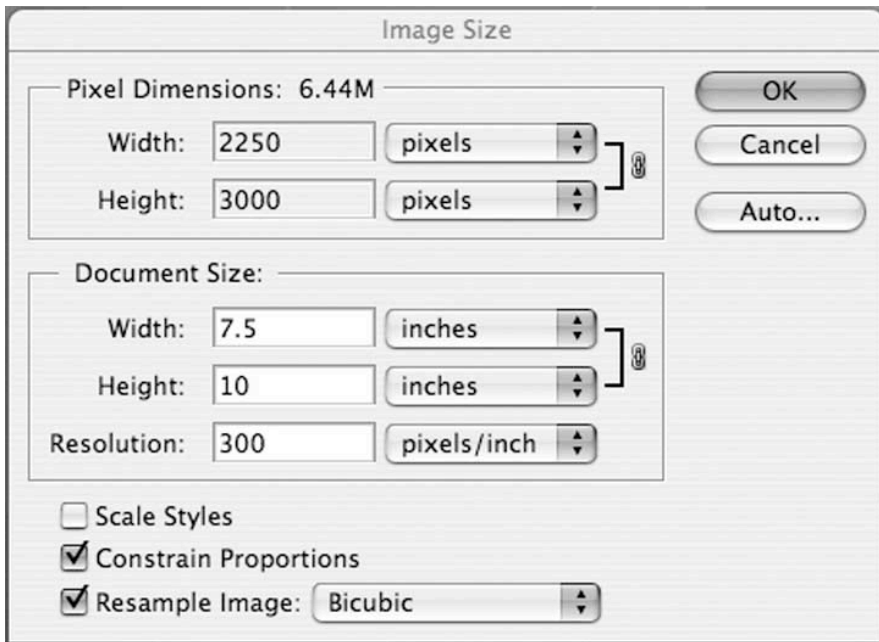
Some Notes on Scanning, Resolution and "Digital Fluff"

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In the world of digital images "RESOLUTION" refers to the density of pixels. In the world of printing it refers to the dots of ink, pigment or plastic being put onto a substrate.

What resolution you choose to scan at depends on what your intended output will be. What kind of printer and what kind of paper or other media you use matters. The general rule of thumb is to scan at twice the intended output resolution. The file can always be converted to a lower resolution (downsampling), but when converting to a higher resolution (upsampling), a loss of quality results (guesstimated, digital fluff pixels are created). Another way to think about it is to scan at the highest resolution you may need, keeping in mind that the higher the resolution, the more space it takes up on your zip disk/hard drive and the slower things will go as you work on your image in the computer.

The **Image Size** dialog box in Photoshop is where image resolution is determined. **Pixel sizes are changeable** and this is one place to do that. Below are common settings for printing an image out on an 8.5 X 11 sheet of paper:



Pay attention to the **pixel dimensions** as the number of pixels is the ultimate determination of the resolution of your image.

The **document size** numbers only matter when you are going to print something out.

Multiplying the resolution number by the height and the width numbers will result in the pixel dimension numbers.

7.5in x 300ppi = 2250 pixels
10in x 300ppi = 3000 pixels
Pixel Dimension: 2250 by 3000

To change the Document Size - such as for printing at a different size - while preserving the original integrity of the pixels, make certain that you **uncheck the RESAMPLE IMAGE box**. In the case of the example above, the box is checked, so changes made in the document size numbers will either increase or decrease the number of pixels. This is fine if what you want to do is shrink the image and print it smaller, but if you are trying to simply expand your image

out to a bigger size, you must be very careful about that. There is a limit to how many fake pixels you can create before the image begins to look blurry. Upsampling is what this is officially called, but I call it Digital Fluff.

PPI - Pixels Per Inch On many monitors, and in digital imaging software, resolution refers to Pixels. The average density of pixels on a monitor is 72, so images made for the web are generally designed around 72 PPI. Images made for printing, however, are generally around 300 PPI

SPI - Samples Per Inch are what scanners measure. They do not read dots; they take samples.

DPI - Dots Per Inch are how printers measure resolution. Dots are not pixels, pixels are little squares on your monitor and dots are what goes onto your paper. They are different, not just in material, but also because it takes more dots to represent each pixel in the image. When printing an image out, resolution needs to be much higher than on a monitor or the image will look fuzzy or grainy.

LPI - Lines Per Inch are the number of lines or rows of halftone dots per linear inch put on a page by printers.

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Additional Information:

As we saw above, if your image is 7.5 by 10 inches at 300ppi, then the pixel dimension is 2250 by 3000 pixels. There are many “sister sizes” that share the same pixel dimensions (2250 by 3000 pixels), but change in size (inches) or in resolution quality (ppi):

2250 pixels = 7.5in x 300ppi & 3000 pixels = 10in x 300ppi

2250 pixels = 6.25in x 360ppi & 3000 pixels = 8.333in x 360ppi → smaller image; higher resolution

2250 pixels = 9.375in x 240ppi & 3000 pixels = 12.5in x 240ppi → larger image; lower resolution

a) What is the pixel dimension for an image that is 5 by 20 inches at 300ppi?

b) Using the pixel dimension from the example above (2250 by 3000 pixels), what would the size be in inches if the resolution was lowered to 200ppi?

a) 1500 by 6000 pixels **b)** 11.25 by 15 inches