

Better Printed Output with *Photoshop*

A Little Understanding of Resolution Can Really Help!

The key to obtaining great prints is understanding a few basic principles of imaging. The number of **pixels displayed per unit of printed length** in an image is usually measured in **pixels per inch (ppi)**. An image with a high resolution contains more, and therefore smaller, pixels than an image of the same *printed* dimensions with a low resolution. For example, a 1-inch-by-1-inch image with a resolution of 100 ppi contains a total of 10,000 pixels (100 pixels wide x 100 pixels high). The same 1-inch-by-1-inch image with a resolution of 300 ppi would contain a total of 90,000 pixels.

Screen resolution

How does this translate into practical terms? For instance, let's consider an image from a digital camera. Say the highest resolution (pixel dimensions) that this camera can capture is 1,600 pixels by 1,200 pixels. If viewed on a screen at a computer screen resolution 1024 x 768 pixels, the image would be larger than what the physical screen can display, and you would have to do some scrolling around to view it.

Printer resolution

Our goal is to figure out how to print images that look great (i.e.; sharp) when printed.

The figure to the right shows the dialog box that comes up when you pull down the **Image** menu and choose **Image Size...** (in *Elements*: menu:IMAGE>RESIZE>IMAGE SIZE). Pay attention to the bottom section of the dialog box. This part is called *Document Size* and is **used exclusively for printing**. This section *does not* refer to the size you see on a computer screen (eg; for email or web). Choosing an arbitrary figure of 72 ppi would result in a correspondingly very large print, but the pixels would be stretched out to accommodate the size, and the print would therefore look highly pixelated. Let's adjust the numbers in this dialog box to optimize our output.

FOR WINDOWS & MAC

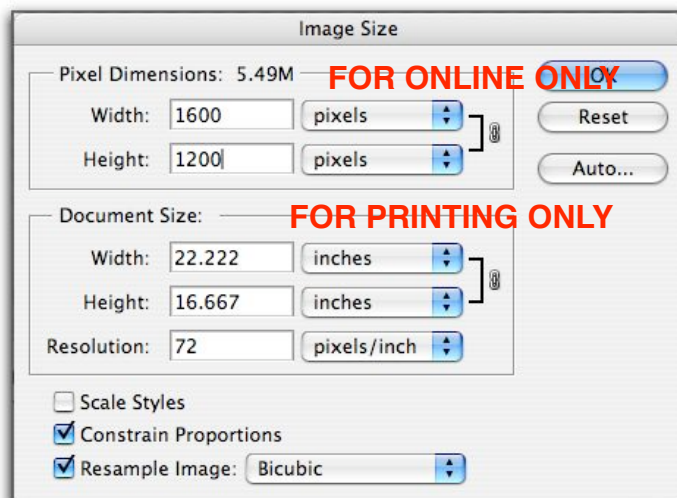


Fig. 1

The Answer

As you might guess from what you've read so far, we'll need to tweak the numbers in the window in Figure 1 to get good printed output. The magic formula depends on following two simple instructions.

- Turn off the checkbox that says **Resample Image**. This is important because if you don't do this, Photoshop will start stretching and compressing pixels, changing your picture, and probably not for the better. (Move on to figure 2)
- Enter a number for **Resolution** that's evenly divisible into the maximum resolution of your printer* (in the case of the Epson Photo 1200, that's 1,440). In figure 2, you can see that I used 360 (which is 1,440/4). The reason for this is you want to avoid having your printer driver software do major calculations to do the stretching and compressing pixels that we avoid Photoshop from doing above.

FOR WINDOWS & MAC

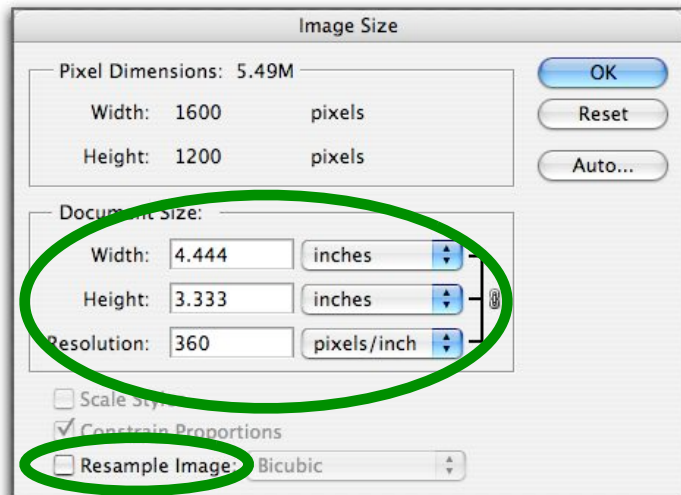


Fig. 2

the desired Width or Height. The other value will fall into place based on the dimension or *aspect ratio* (width to height) of your image. When you do this, as long as **Resample Image is disabled**, the Resolution field will show you the result based on your desired physical print size entries. If this figure is much below 240 ppi, you will start to introduce “pixelation” in the printed image. This means that your eye can actually start to discern the individual pixels in the image, and hence, result in a loss in sharpness.

In figure 3, since **I want to print on an 8x10 sheet of paper**, I've entered the 10 inches for the width, and Photoshop enters the Height based on the existing aspect/dimension ratio of the image. Since the Width, Height, and Resolution fields are mathematically linked, Photoshop changes the Resolution to 160. However, this *may* be too low for a decent print, but it depends on the printer. For my Epson printer, it just doesn't cut it. Try it, and see what happens. Typically in modern inkjet printers acceptable Document Size resolution will fall between 220 and 340 ppi.

Important reminder: Be certain you go into the **Page Setup...** dialog box and set the orientation of the document to either Portrait or Landscape to match your photograph.

If you work with higher-resolution photographs, such as the ones you get from cameras with megapixel ratings above 7 MP, (Megapixels) you have a lot more flexibility, and of course you'll end up with more data to print. In these cases, you're often able to size your photographs up to 8x10 and higher, even at pleasant resolutions such as 360 dpi.

Once this process is complete, you will probably say something to the effect of "Gee whiz, I just spent hundreds on a whizzy new digital camera and you're telling me I can't get anything more than 3 by 4 inch prints?" That's not really true. I encourage you to try other values in the Resolution field. For example, you may try 180 instead, which will end up filling more of an 8.5x11 page. Today's modern printers and their software do a very good at preparing an image for less-than-ideal resolution.

Your most likely printing scenario: Since you know what size print you want - usually dictated by the paper you have on hand or the size of the frame you are trying to fill - you can start by entering the **print size** values directly in the **Document Size** section. Enter the value for either

FOR WINDOWS & MAC

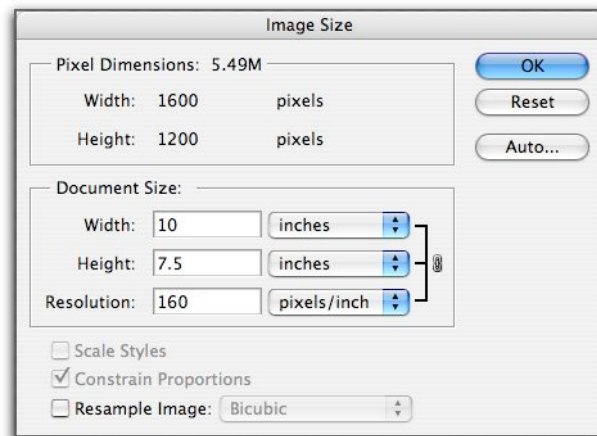


Fig. 3

* This “Printer Resolution” is provided in the technical specifications for the printer. For example, a typical published resolution might be “1440*720 dpi” [notice, this is **dots per inch (dpi)** not pixels per inch (ppi)]. DPI **is** correct for inkjet printer output because the printer sprays *dots* of ink onto the paper.