

Understanding Digital Images by Joan Fenicle (joanf41@gmail.com)

Resolution is defined as a bunch of dots that are assigned or mapped to a given space. In digital images, these dots are referred to as pixels. These pixels contain information about each tiny square of the image such as color, grayscale or black and white information. Resolution is the number of pixels per inch of the image. The more pixels per inch, the smaller the pixels, the more detail the picture will have and a larger file size. Fewer pixels per inch, larger pixels, less detail in the picture and smaller file size.

The goal is to have the correct number of pixels needed for the output and this will vary depending on where the image is to be published.

Computer monitors, projection equipment and slide imaging cameras all have different pixel measurements. But generally, for on line publishing you will be working with a resolution of 72dpi (pixels per inch). Anything more is unnecessary and just slows down the loading of your file which can be very important with web sites.

Print publication and some video requires a resolution of 300dpi minimum.

So, you have taken a picture with your new digital camera and its measurements are 2461 x 3171 pixels at 72dpi. (34 inches by 44 inches). You want to send it to someone for publication and they require a high resolution image at least 3 inches wide. What do you do next?

It's not as confusing as it sounds – it's all about the pixels. You can't just make the image 300dpi. You need to compute the new size and then change the resolution and the size. Take the 2461 and divide by 300 (the desired pixel density or resolution). You find that the new image will be 8.2 inches by 10.57 inches at 300dpi. Round this off to 8x10 and you are all set. However, if you are starting with an image that is only 320 pixels by 400 pixels, you find that your end result will only be 1 inch by 1.3 inches – not much bigger than a postage stamp and not usable by the publication.

The other thing you need to understand are file types. JPEG images are used on Web pages and work great in email. Since JPEGs are a compressed file format, the files are much smaller than an original format such as TIFF. This is great for web pages as they load quickly. But editing a JPEG file will cause degradation of quality in the image **each time the file is saved** – throwing information away every time so that eventually the quality of your image will be poor regardless of the pixel density. If you have the option, save your original image as a TIFF or PSD (Photoshop) format as large as you have it – then edit its size and file type as needed for different uses.

You are limited in the quality of your images by your digital camera. If you want high quality 8x10 photos, you will need at least a 5 megapixel camera. A 10 megapixel camera is a good match for a 13x19 output printer. It is nearly impossible to preserve an image's quality if you try to increase it beyond a pixel-imposed size limitation.