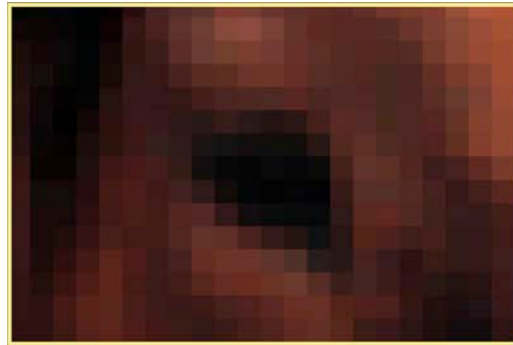


2. Basic Concepts in PS

· Everything in Photoshop is based on what is called **PIXELS**. Pixels are those little squares that we see when we zoom in on an image as much as possible. With the magnifying tool, select a small portion of the image and you will be able to see the pixels. Each pixel in the image has the same size and a uniform color and brightness. You can zoom out quickly by clicking on the “Actual Pixels” button in order to see the photo again.



· When working on an image, **SIZE** is very important. The size of the image you need, will depend on the work you are doing. For printing, you will need a ‘big’ image in order to get a good quality print, on the other hand, for website, a smaller image should be enough, but you lose quality. It is very important that we always work with a higher resolution image and then reduce it to a smaller size at the end.

· Images files are big and they keep increasing size; that is why we need some kind of **COMPRESSION**. There are two different ways of compression and the amount we use, will determine the final result:

- Lossless compression: it reduces the size of the image without losing quality.
- Lossy compression: it reduces the size of the image greatly but the image loses quality.

What compression does to an image is organize the information about color, brightness and the position of the pixels in a different way in order to reduce the size. (In general, we should keep the image at its best quality but for the web we would compress it, because uploading fast is more crucial than the best image quality.)

We can compress the size of the images by reducing the memory. The same image will show different file sizes. For instance, an image that is 4.2MB on disk, will be 12.8MB when opening in Photoshop, and 476 KB if we save it for the web.

Images can be stored in different formats. The most common usage are:

- **JPEG (.jpg)** → (*Joint Photographic Experts Group*) It is the most common industry standard format for web or storage. It uses a lossy compression.
- **GIF** → Graphics Interchange Format. It is used on the web for logos and images with a small number of colors. You can store transparency, animation and a maximum of 156 colors.
- **PNG** → (*Portable Network Graphics*) It is a graphic format specifically designed for use on the web. It uses lossless compression.
- **JPEG 2000** → This is another compression method which can produce better results than the standard JPEG. It uses lossless compression.
- **TIFF (.tif)** → (*Tagged Image File Format*) It is standard for images for magazines and movies. It uses a lossless compression and it supports layers and transparency.
- **TGA (.tga)** → (*TARGA File Format*) It can be used to create textures with transparency for 3D Softwares. It uses a lossless compression and it also supports transparency but not layers.
- **Photoshop (.psd)** → Photoshop Document.
- **Raw (.dng)** → (*Camera Raw and Digital Negative*) This format stops the camera from processing the color data collected from the sensor.

• **RESOLUTION** is the term we use to describe the number of dots or pixels in an image. Resolution is very important because it is related to quality but it is also confusing because it describes what the quality of the image is when it is captured, displayed or output through various devices.

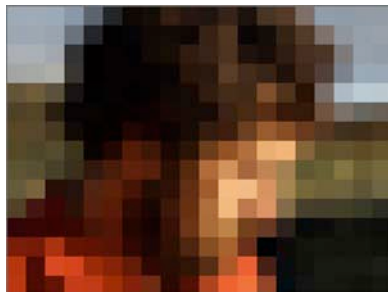
We often hear about an image at high or low resolution (hi-res or low-res). High resolution means that more pixels are used to create a much crisper and cleaner image, normally used for print while low resolution uses less pixels, therefore the image will not be as clear.

If we take a photo or scan an image and we increase the total number of pixels in the image (before taking the photo), its quality and size will increase, so depending of the resolution we choose, the image will have big or smaller pixels.

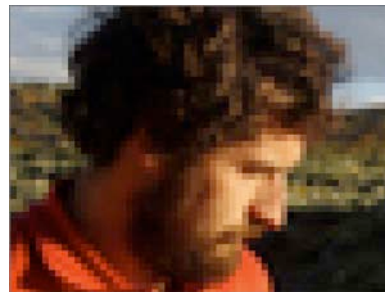
We can also have an image with the same pixel dimension but different resolutions as shown in the example below. Both images have a pixel dimension of 300x400 but the resolution is 300ppi for the smaller image and 150ppi for the bigger one.



Lastly, as mentioned earlier, a pixel does not have an exact size. If we increase the resolution of an image, holding fixed the document dimension, the pixels will get smaller. When talking about the size of an image, we need to clarify whether we are talking about its pixel dimensions or its document size.



10 pixels per inch



30 pixels per inch



72 pixels per inch



300 pixels per inch

• The terms **DPI** and **PPI** are always mixed up causing confusion. Dpi refers to the resolution of the printing device, while PPI refers to the image itself.

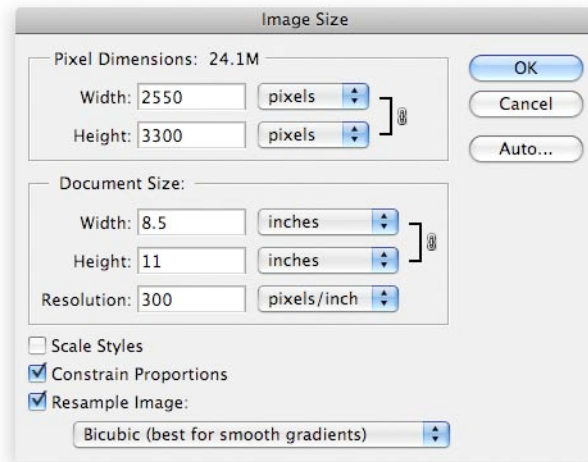
Ppi (pixels per inch) is a measurement that defines the size an image will print. An image that is 1800 by 1200 pixels at 300ppi will print at a size of 6 x 4". Or it could also be printed at 150 ppi and in this case, the printed size would be 12 x 8'. The higher the ppi value, the better quality you will get.

Dpi (dots per inch) is a measurement that defines the amount of dots of ink that are placed on the printed image. If the dpi in a printer is high, the printed image will appear clearer.

Don't work with files with excessive pixel dimensions if it is not necessary because it will slow down your working process a lot.

• The **Image Size Window** can be found going to Image > Image Size.

Before we start retouching a photo, we should determine which image size we need for our project.



Pixel Dimensions shows the number of pixels that the document has. it also determines the file size in terms of kilobytes.

Document Size shows the document's dimensions for the output device we will be using.

Resolution shows the amount of ppi the document has.

The link icons on the right next to 'pixels' and 'inches' means that the height and the width are link together so they change proportionally. To unlink uncheck the 'Constrain Proportion'.

Select 'resample' if you want to preserve the pixel dimensions in the image. Resampling an image implies a change in the pixel dimensions.

If we increase the print dimension, the resolution will be reduced and if we increase the resolution, the print size will be reduced based on the amount of pixels available.

When changing the screen size of an image, you generally would have 'resample' checked and modify the pixel dimensions. When changing the print size, you would want to leave 'resample' unchecked and change either the print dimensions or the resolution.

If you need to increase the print size and don't have enough pixels, you will have to 'resample' the image in Photoshop. This will create new pixels and it often can result in an image of poor quality.