Fact Sheet : Image Size - Resize

This lesson is an attempt to clarify resolutions for your file submissions as you move into the shooting assignments and provides a critical level of understanding regarding the sizing and resizing of images for screen and for print. PPI and DPI are units to describe the output resolution of an image when displayed on a screen (PPI) or printed out on paper (DPI). If you divide the image size (total number of pixels of the digital image) to the final output resolution, you can determine the size with which the image is shown on screen or printed out.

Our concern primary concern is the ppi as we are working with the screen resolution for the class and we will concern ourselves with that as our primary unit of measurement.

When submitting files for assignment please resample or down sample all images to 8.5 X 11 inches at 72 ppi.

It is generally best to maintain the original resolution of your file and to not down sample or interpolate (up sample) your images for the best quality in terms of focus and clarity.

Screen Resolution - Pixels Per Inch - PPI requirements are resolutions of 72 to 96 Pixels per inch - this is the highest resolution a screen is capable of displaying - this resolution is size or dimension independent. In other words the monitor displays a resolution of 72-96 pixels per inch at the size of the display irrespective of the file size.

Print Resolution - Dot Per Inch - DPI requirements are determined by the level of detail expected but generally for photographic imagery should be within a range of 180 and 360 dpi to generate an image of expected photographic clarity. Printers vary with regard to number of dots per inch they are capable of producing however, Ink Jet printers by which most of fine arts prints are produced using are capable of 300 - 360 dpi - the general standard is to use 300 dpi.

The camera manufacturer determines the resolution in which it delivers JPEGs to the media card. The standard originally was to produce JPEG images at monitor or screen resolutions of 72 dpi. The physical size or dimensions are determined by the size of the sensor and the number of pixels it is capable of producing but, the image is not sized. (Some camera manufactures have over the years varied from the standard

and now write 180 ppi to 240 ppi images to the media card. You will need to check your files to determine how your files are written.) When you work with the scale or size of the images you'll notice they are very large in physical or print dimensions if written at 72 or 96 ppi - this is because the sensor generates an image of considerable pixel resolution. Physical or Print Dimensions however, are irrelevant to the screen, resolution is the only important factor. When preparing a file to print then, that scale or size converts to pixel density or resolution when the images are scaled to print dimensions. In printing size and resolution are both equally important.

Examples are :

A 18.0 megapixel sensor will generate a 72 X 48 inch image at 72 ppi which will then convert to 17.28 X 11.52 inch image at 300 or print resolution.

A 24 megapixel sensor will generate a 41.667 X 55.556 inch image at 72 ppi which will then convert to 8.33 X 11.111 inch image at 360 or print resolution.

To see the relationship of image to resolution or to modify the dimensions of your image.

- from within Adobe Photoshop go to menu item --> Image --> Image Size. From this menu - set the option to **Resample Images** to the **off** position or unchecked. Then, adjusting image height and width to see the resolution increase.

If required to enlarge beyond the image beyond is native resolution then you would need to interpolate the image or make up the pixels required to reach a minimum resolution for print. When we want to reduce the size and dimensions of a file we must resample the image as well.

Resampling is to reduce the number of pixels (making image smaller) or create more pixels (making larger) - when decreasing size it is a form of downsampling. When increasing size it is a form of interpolation (calculated increase in number of pixels per square inch).

To down sample - turn on Resample image and adjust image height, width or resolution to the desired settings.

To up sample or increase the original size - set Resample Image to the off postion and adjust the image height and width to the appropriate print dimensions assuring that

the resolution is within the limit of what is required to print. If you exceed 360, disregard the extra resolution as the printer will only print what it is capable of printing and will automatically discard the residual resolution.

A couple of online resources to clarify PPI vs DPI are provided below.

The difference between PPI and DPI - by Jeremy Daalder

https://imagescience.com.au/knowledge/the-difference-between-ppi-and-dpi

DPI vs Pixels : What do I use?

https://designshack.net/articles/graphics/dpi-vs-pixels-what-do-i-use/

Sony - What is the difference between Dot Per Inch and Pixels Per Inch:

http://sony-eur-eu-en-web--eur.custhelp.com/app/answers/detail/a_id/30671/~/what-is-the-difference-between-dots-per-inch-(dpi)-and-pixels-per-inch-(ppi)%3F