File Types: Raster vs. Vector
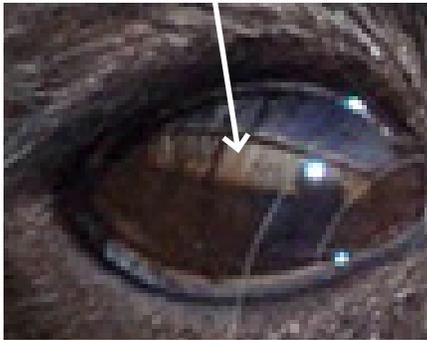
RASTER IMAGES (pixels)

This is a RASTER image.

The orgiginal is:
1200 pixels wide
1361 pixels high

HIGH RESOLUTION:
300 pixels/inch

Pulling an image off of the web and trying to get it to fit the dimensions of your print project just won't work. You will end up with a pixelated image that appears stretched and distorted.

Raster images are composed of PIXELS, which can be seen (above) when a photo is greatly enlarged. An image is made up of a collection of pixels referred to as a bitmap.

RASTER images are **resolution-dependent meaning** that a large file requires a large bitmap. The larger the image, the more disk space you will need.

Pixels have a defined proportion based on their resolution (high or low), and when the pixels are stretched to fill space they were not originally intended to fit, they become distorted, resulting in blurry or unclear images.

Scaling down large images is easy but *enlarging* a bitmap makes it pixelated or simply blurred. In order to retain pixel quality, you cannot resize raster images without compromising their resolution. As a result, it is important to remember to save raster files at the exact dimensions needed for the application. Hence **for images which need to scaled to different sizes, we use vector graphics**.

Printers and display devices are raster devices.

> DPI = dots per inch
> PPI = pixels per inch
> **Websites** display images at 72dpi (low resolution)
> **Printed images** should be no less than 300dpi.

RASTER File extensions: .BMP, .TIF, .GIF, .JPG, RAW

For More Information:
https://en.wikipedia.org/wiki/Raster_graphics
https://www.en.wikipedia.org/wiki/Vector_graphics
https://www.en.wikipedia.org/wiki/Bitmap

VECTOR IMAGES (bezier curves)

Adobe Illustrator is the #1 software used to produce vector images.
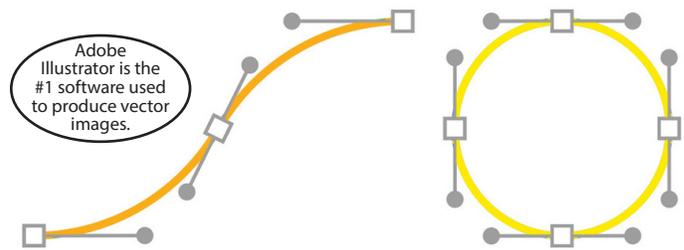
If you have an image that you need as small as a postage stamp and as big as a building, then **VECTOR** is your solution. Vector graphics are best for printing since it is composed of a series of mathematical curves. As a result vector graphics print crisply even when they are enlarged.

Rather than having a bit in the file for each bit of line drawing we use commands which describe series of points to be connected. The result is a much smaller file size.

Vector graphics draw sontinuous and smooth lines. Your logo and brand graphics should have been created as a vector, and you should always have a master file on hand.

VECTOR File extensions: .SVG, .EPS, .PDF, .AI, .DXF

IMAGE FILE TYPES

RASTER   VECTOR

.BMP	Handles graphic files within the Microsoft Windows OS. I never use bitmap format.
.PNG	PNGs are "lossless," meaning you can edit them and not lose quality. Best for online viewing, NOT print.
.TIF	A TIF is a large raster file that doesn't lose quality. This file type is known for using "lossless compression," meaning the original image data is maintained regardless of how often you might copy, re-save, or compress the original file.
.GIF	Limited to an 8-bit palette, or 256 colors. Due to its animation capabilities, it is still widely used to provide image animation effects
.JPG	JPEGs are known for their "lossy" compression, meaning that the quality of the image decreases each time to manipulate, resize, and save an image.
.RAW	When you snap a photo with your camera, it's saved immediately in a raw file format. RAW images are valuable because they capture every element of a photo without processing and losing small visual details.
.SVG	A versatile, scriptable and all-purpose vector format for the web and otherwise.
.EPS	EPS is a file in vector format that has been designed to produce high-resolution graphics for print. The EPS extension is more of a universal file type (much like the PDF) that can be used to open vector-based artwork in any design editor, not just the more common Adobe products.
.PDF	PDFs were invented by Adobe with the goal of capturing and reviewing rich information from any application, on any computer, with anyone, anywhere. I always save an extra copy of a file in .PDF format, just in case.
.AI	Illustrator produces vector artwork, the easiest type of file to manipulate.
.DXF	A CAD data file format developed by Autodesk[2] for enabling data interoperability between AutoCAD and other programs.