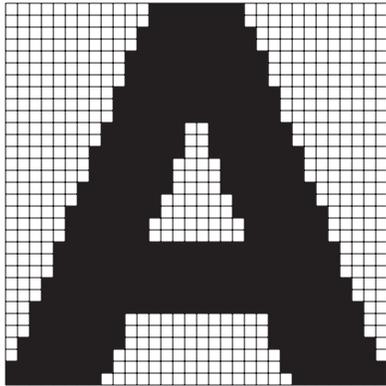


Understanding File Formats

First, it is important to understand there are two kinds of graphics created on a computer: **raster** images and **vector** images.

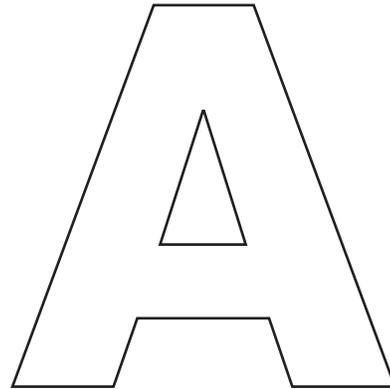
Raster images are composed of a grid of pixels (often called bitmap images).



Raster (bitmap) images require higher resolutions to appear smooth. Raster images are best used for photographs and images with subtle shading, (continuous tone images).

Raster file formats include TIFF, JPG, GIF, BMP, PNG, PSD, EPS.

Vector images consist of points, lines and curves based on mathematical definitions.



The edges of vector graphics remain smooth at any size or resolution. Fonts, line art (charts and graphs) and illustrations are typically vector-based.

Vector file formats include EMF, EPS, PDF, PS.

Raster File Formats

Raster file formats differ by the amount of data contained in the image. The smaller the file, the less data there is. The amount of data affects both the quality and the color of the image. As a rule of thumb, on-screen viewing requires less quality and fewer colors than printed material. Below is a list of raster file formats, listed from higher quality to lesser quality.

TIFF (Tagged-Image File Format)—A large raster file. It is used when a high resolution photographic file is needed. Typically used for print production.

PSD (Photoshop Document)—An Adobe Photoshop raster file in its native file format. Layered Photoshop files default to .psd. To save in other formats, use the *Layers: Flatten Image* command.

EPS (Encapsulated PostScript)—Although typically a vector art file format, if an image is saved as a Photoshop EPS file, it is a large raster file similar to a TIFF file.

JPG (Joint Photographic Experts Group)—A compressed raster file. It is used when a small photographic file is needed (typically for the Web). JPG files can be created at a variety of compression levels. More compression equals less quality. It is important to know the resolution of a JPG file to determine if the image is of high enough quality to be used for print production.

PNG (Portable Network Graphics)—A small, limited-color raster file, used for on-screen viewing. Designed to replace the GIF file format, it has more color options than a GIF file.

GIF (Graphics Interchange Format)—A small, limited-color raster file. It is used for on-screen viewing only, when a very small file with just a few solid colors is needed.

BMP (Windows Bitmap)—A raster file specific to Windows with limited color options.

continued

Vector File Formats

Vector file formats are created using mathematical definitions to produce smooth paths. They can be scaled in size without any loss of quality. They are typically used for type, illustrations and line art.

EMF (Enhanced MetaFile)—A Microsoft Windows vector art file.

EPS (Encapsulated PostScript)—A file created by an illustration program (e.g., Adobe Illustrator, Corel Draw, etc.) using the PostScript language. EPS files can also contain raster images, but typically a **vector eps file** indicates a line art illustration, such as a logo or a graph. It is important to note the difference between a vector eps and a raster eps file. When printed, artwork saved as a vector eps file will be very crisp (for example, an Excel graph brought into Adobe Illustrator), while artwork saved as a raster eps may have soft edges (for example, an Excel graph brought into Adobe Photoshop).

PDF (Portable Document Format)—An Adobe Acrobat file that can be both vector and raster, depending on the original artwork. If the original artwork is a vector file, the pdf will be vector art; if the original artwork is a raster file, the pdf will be a raster file. Pdf files are often a combination of both. Pdf files are compressed—like jpg files, the compression can be created at a variety of compression levels, which have an impact on the end quality of the reproduction. For print purposes, pdf files should be saved at the highest resolution possible, which is only possible if the pdf file is created using Adobe Acrobat Distiller or a PDF creation program (e.g., Adobe Acrobat Professional).

PS (PostScript)—A file in the PostScript language, created by using a PostScript print driver.

Color Modes

Monochrome Images consisting of only black and white.

Grayscale Images with 256 shades of gray, ranging from black to white.

CMYK Primarily for full color printing. CMYK is an acronym for cyan, magenta, yellow and black, the standard colors used in offset printing.

RGB Primarily for on-screen viewing. RGB is an acronym for red, green and blue, the colors used for computer monitors and video electronics.

Resolution

Print resolution is measured in dots per inch or **dpi**. The higher the resolution, the higher the quality of the printing. Minimum resolution for photographic images is 300 dpi at final reproduction size (100 percent). Minimum resolution for monochrome line art (diagrams, drawings and graphs) is 1200 dpi at final reproduction size (100 percent).

Computer monitors display images at approximately 72 dpi. That means images saved for Web viewing on a computer are not typically suitable for printing.