

VECTOR GRAPHICS AND RASTER GRAPHICS (bitmap or jpeg {compressed})

- Be sure your students understand the differences so they know when to use which type.
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From Wikipedia: http://en.wikipedia.org/wiki/Vector_graphics

Vector graphics is the use of geometrical [primitives](#) such as [points](#), [lines](#), [curves](#), and shapes or [polygon](#)(s), which are all based on mathematical equations, to represent [images](#) in [computer graphics](#).

Vector graphics formats are complementary to [raster graphics](#), which is the representation of images as an array of [pixels](#), as it is typically used for the representation of photographic images.^[1] There are instances when working with vector tools and formats is best practice, and instances when working with raster tools and formats is best practice. There are times when both formats come together. An understanding of the advantages and limitations of each technology and the relationship between them is most likely to result in efficient and effective use of tools.

[Vector graphics editors](#) typically allow rotation, movement, mirroring, stretching, skewing, [affine transformations](#), changing of [z-order](#) and combination of primitives into more complex objects. More sophisticated [transformations](#) include set [operations](#) on closed [shapes](#) ([union](#), [difference](#), [intersection](#), etc.). Vector graphics are ideal for simple or composite drawings that need to be device-independent, or do not need to achieve [photo-realism](#). For example, the [PostScript](#) and [PDF page description languages](#) use a vector graphics model.

Printing

Vector art is key for [printing](#). Since the art is made from a series of mathematical curves it will print very crisply even when resized. For instance, one can print a vector logo on a small sheet of copy paper, and then enlarge the same vector logo to [billboard](#) size and keep the same crisp quality. A low-resolution [raster graphic](#) would blur or pixelate excessively if it were enlarged from business card size to billboard size.

If we regard typographic characters as images, then the same considerations that we have made for graphics apply even to composition of written text for printing ([typesetting](#)).

Older character sets were stored as bitmaps, therefore to achieve maximum print quality they had to be used at a given resolution only; these font formats are said to be non-scalable. High quality typography is nowadays based on character drawings ([fonts](#)) which are typically stored as vector graphics, and as such are scalable to any size. Examples of these vector formats for characters are [Postscript fonts](#) and [TrueType fonts](#).

JPEG Images

From Wikipedia: <http://en.wikipedia.org/wiki/JPEG>

In [computing](#), **JPEG** (pronounced *JAY-peg*) is a commonly used method of [compression](#) for photographic images. The degree of compression can be adjusted, allowing a selectable

tradeoff between storage size and image quality. JPEG typically achieves 10:1 compression with little perceptible loss in image quality.

JPEG compression is used in a number of [image file formats](#). JPEG/[Exif](#) is the most common image format used by digital cameras and other photographic image capture devices; along with JPEG/[JFIF](#), it is the most common format for storing and transmitting photographic images on the [World Wide Web](#). These format variations are often not distinguished, and are simply called JPEG.

Bitmap Images

From Wikipedia: <http://en.wikipedia.org/wiki/Bitmap>

In [computer graphics](#), a **bitmap** or **pixmap** is a type of [memory](#) organization or [image file format](#) used to store [digital images](#). The term *bitmap* comes from the [computer programming](#) terminology, meaning just a *map of bits*, a spatially mapped [array of bits](#). Now, along with *pixmap*, it commonly refers to the similar concept of a spatially mapped array of [pixels](#). [Raster](#) images in general may be referred to as bitmaps or pixmaps, whether synthetic or photographic, in files or in memory. In some contexts, the term bitmap implies one bit per pixel, while pixmap is used for images with multiple bits per pixel.^{[1][2]}

Many [graphical user interfaces](#) use bitmaps in their built-in graphics subsystems;^[3] for example, the [Microsoft Windows](#) and [OS/2](#) platforms' [GDI](#) subsystem, where the specific format used is the *Windows and OS/2 bitmap file format*, usually named with the [file extension](#) of .BMP (or .DIB for *device-independent bitmap*). Besides BMP, other file formats that store literal bitmaps include [InterLeaved Bitmap \(ILBM\)](#), [Portable Bitmap \(PBM\)](#), [X Bitmap \(XBM\)](#), and [Wireless Application Protocol Bitmap \(WBMP\)](#). Similarly, most other image file formats, such as [JPEG](#), [TIFF](#), [PNG](#), and [GIF](#), also store bitmap images (as opposed to [vector graphics](#)), but they are not usually referred to as *bitmaps*, since they use [compressed](#) formats internally.