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## Why Does Clip Art Print Out Jagged? (2/96)

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TOPIC -----

Why is it that some clip art I have prints smoothly, while some has jagged edges?

DISCUSSION -----

There are two types of graphics formats used on personal computers: bitmapped and vector (or object-oriented) graphics.

### Bitmapped graphics

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Bitmapped graphics are a matrix of picture elements (called pixels), each one of which has a color assigned to it. The collection of these elements define what an image looks like. Since it is a matrix, the image you look at does not have any inherent properties which define its characteristics. For example, a "line" is a collection of dots, rather than a solid line.

If the image is scaled or magnified, the dots will become more visible. Considering that your screen has a resolution of about 72 dots per inch, and even low-end printers have 300 dots per inch, it is more likely that you will see such "pixellation," especially if color information is lost as part of the printing process.

In Macintosh terminology, MacPaint, TIFF, GIF, or JPEG images are bitmapped graphics, so you can expect to see some pixellation when you print. Exceptions would be pixmaps which are imaged at extremely high resolution--resolutions which equal or exceed your printer's resolution. You will find it easy to spot these because they tend to be several megabytes in size.

### Vector images

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Vector images are object-oriented collections of geometrically defined elements. For example, a line really is a line--an object which consists of information specifying its start and end coordinates, color, width, and other characteristics. Similarly, text just consists of the string information to draw and some font information. The dots that comprise the letters are not stored.

A picture comprised of vector elements can be scaled to any size, and the resulting output will be very smooth and will generally contain the

characteristics of the original image.

On your Macintosh, vector formats include PICT, EPSF, and PostScript.

#### Conclusion

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There are literally hundreds of file formats in use in the Macintosh, UNIX, and PC worlds. However, the basic limitations above apply, and many programs allow graphics to be imported from similar formats.

So, to avoid bitmapped printouts of your clip art, you need to obtain clip art which consists primarily of vector graphics. Most PICT-based packages would satisfy that requirement, but you should check with the publisher to verify this. If the PICT image is solely defined of one big bitmap, you will get pixellation.

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