June 2007

PRINtips

Using Graphic Elements...

Critical Factors to Consider

Graphics
Printing
Mailing
Under One Roof

TechneGraphics, Inc.
Park 50 TechneCenter
2002 Ford Circle
Milford, OH 45150

(513) 248-2121
Fax (513) 248-5141

Web site:
www.techgra.com

File Transfer site:
www.tgidirect.net

FTP site:
ftp.techgra.com

Email:
info@techgra.com

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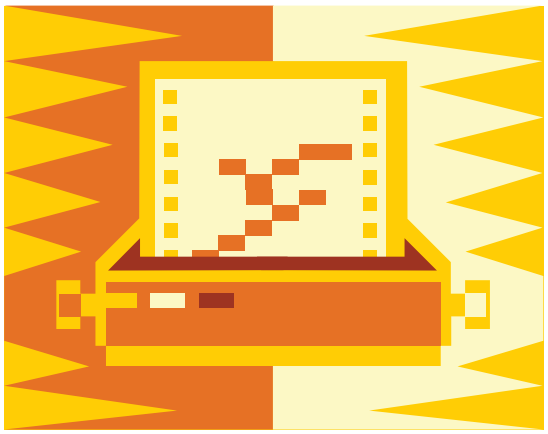
You are likely familiar with the proverb "a picture is worth a thousand words". Those seven words succinctly convey how powerfully a graphic image enhances our understanding of a concept or idea. Interestingly, the modern use of the proverb is attributed to an article by Fred R. Barnard in an advertising trade journal called *Printer's Ink*. In his 1921 article, Barnard promoted the use of images to augment advertisements on streetcars.

What was true in 1921 remains true today – graphic images enliven the appearance, impact and reader comprehension of a printed piece. However, to get the greatest benefit, the images must be of sufficient quality to blend in with the design. Think of the last time you saw a color photograph in a newspaper that was very blurry – the result of the image being *out of register.* Did you notice the content of the photograph, or just the fact that it was out of register?

Image resolution

A critical factor in determining the quality of a graphic image is its *resolution.* Resolution describes the output quality of an image and is stated differently depending on the output device. *Dots per inch (dpi)* is the term for printing resolution; *lines per inch (lpi)* for halftone photographs; and *pixels per inch (ppi)* for screen resolution. *Samples per inch* refers to scanning resolution.

You will hear us refer to images as being *high resolution (hi-res)* or *low resolution (lo-res).* In general, high resolution is an image having a minimum of 300 dpi when the image is at 100% of the size it will appear in the document. In contrast, low resolution has 100 ppi or less. Note that we



used both *dpi* and *ppi*. The term *dpi* is often used interchangeably with *ppi* which can be confusing as well as incorrect. Just remember that *dpi* refers to the resolution of the printing device and *ppi* refers to the resolution of the image itself.

Because so many graphic images and photographs are available on the Internet, and because they can be copied and pasted with just a few keystrokes or mouse clicks, it is tempting to incorporate these downloaded images into documents. And when you do so, the image looks just fine on your computer screen.

But understand that a 100 ppi image is missing a significant amount of information when compared to a 300 dpi image, and this missing information is what makes the image look sharp and well defined. The problem is exacerbated when a 100 ppi image is enlarged. Too few pixels are spread over a larger area, increasing the space between pixels and degrading the image.

Other graphical elements

There are other graphical elements that can be used as effectively as a photograph – illustrations, cartoons, charts, maps, diagrams and original

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"Be sure that all photographs and graphic elements are worthy of being published..."

drawings are a few. Graphical elements are powerful in any layout because they draw the reader's eye and often help make text more comprehensible.

Since graphical elements are so dominant, it is important to employ them carefully. Begin with an analysis. The best graphical elements will meet these criteria:

- worthy of being printed
- good quality
- relevant to the text
- consistent with the document's design and layout

Be aware that scanning an image limits your ability to scale and otherwise manipulate the artwork. You will have more options if you create your own artwork using a program that produces vector art. *Vectors* are mathematical equations that describe the lines of the artwork. Adobe Illustrator, CorelDraw and Macromedia Freehand are all examples of software programs that produce vector art.

Clipart is another source of artwork. The term *clipart* is a kind of catchall for non-photographic images and is derived from the practice of clipping out a specific image from a book of collected images. Today, clip art is electronic and collections are published on CDs or downloaded from the Internet. Electronic clip art comes in both bitmap and vector formats. Vector format provides more options for altering the image.

Charts, graphics, diagrams, tables and maps are examples of *information graphics* or *infographics*. Infographics are visual representations of information, data or knowledge and are used to help readers quickly understand. A traffic sign is an example of an infographic.

Charts and graphics are used to compare numeric information and need to be very clear with easy-to-read labels. Diagrams are also used for numeric information, but instead of contrast, they explain an order, relationship or process. Tables organize data for analysis in columns and rows.

"Invisible" graphic elements

The underlying structure of your document represents the "invisible" graphic elements that will help you place visible elements effectively. The foundation is a *grid* – an underlying pattern of geometric shapes (usually rectangles) that guide the layout of visible elements. The rectangles contain all elements of the document, from text to headlines to artwork and photographs. Rectangles are the building blocks of layout and allow for great flexibility in moving elements around on a page or panel of a document.

The individual shapes in a grid are called *frames* and they can be filled with text or any graphic element. Text frames can be further divided into columns.

White space, margins and gutters keep the elements in each frame from running off the page or colliding. *White space* is any area devoid of an image; it can be increased or decreased to change the open feeling of the document. A *margin* is white space that creates a buffer zone between text or graphic elements. The margins between columns of text are known as *gutters*.

Page geometry

We recommend you to think of document layout as a kind of page geometry. Use the *golden proportion* (described in *The Idea Corner*) to set the size and shape of the rectangular frames that hold text and graphics. Be sure that all photographs and graphic elements are worthy of being published, are of high quality, are at the appropriate image resolution, and are consistent with the overall design and layout.

If you would like to discuss your understanding of this topic, please call 513-248-2121. We'll be happy to provide additional information to help you use graphical elements for maximum effectiveness.

The Golden Proportion

Professional designers often make use of the *golden proportion*, a mathematical concept that defines a specific relationship between the longer and shorter sides of a rectangle. Dividing the longer side of a rectangle by the shorter side yields a ratio between the two sides. A ratio between 1.5 and 1.75 is very pleasing to people.

Consider the dimensions of a standard business card: 2 inches high and 3.5 inches wide. Divide 3.5 by 2 and the result is 1.75. Thus 2:3.5 is a golden proportion. So are two popular sizes of photographs – 3x5 (5 divided by 3 = 1.67) and 4x6 (6 divided by 4 = 1.5).

Use the golden proportion to define rectangles containing text, photographs, graphic images or even white space within your documents. The resulting layout will be pleasing to your audience.

IDEA CORNER

"Use the golden proportion to define rectangles containing text..."

Q. What is a bitmap image?

A. A bitmap image is a matrix of individual pixels, each with its own color. Although a bitmap image can be any color, typically color is used in four predictable ways.

- *Line art* images contain only two colors – black or white. The computer has to use only one bit to assign color to each pixel: on=black; off=white.
- *Grayscale* images contain various shades of gray as well as pure black and white.
- *Multitone* images contain shades of two or more colors. A well-know multitone is the *duotone* usually consisting of black and one other color.
- *Full color* images use a color space such as RGB or CMYK to assign colors to each pixel.

A bitmap does not need to contain a bit of color-coded information for each pixel on every row; it only needs to contain information indicating a new color as the display scans along a row. Thus, an image with much solid color will tend to require a small bitmap (and smaller file size).

Q&A
questions and answers

"Although a bitmap image can be any color, typically color is used in four predictable ways."

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US Postage
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Milford, OH

513-248-2121
Fax 513-248-5141
www.techgra.com
info@techgra.com

TECHNE GRAPHICS INC.
2002 Ford Circle
Milford, OH 45150

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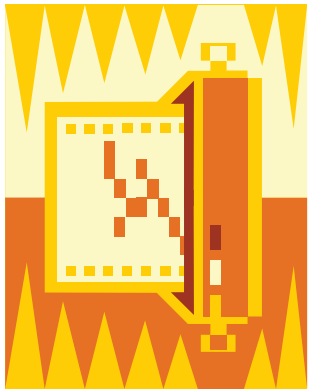
Putting It Altogether: Using Graphical Elements in Documents



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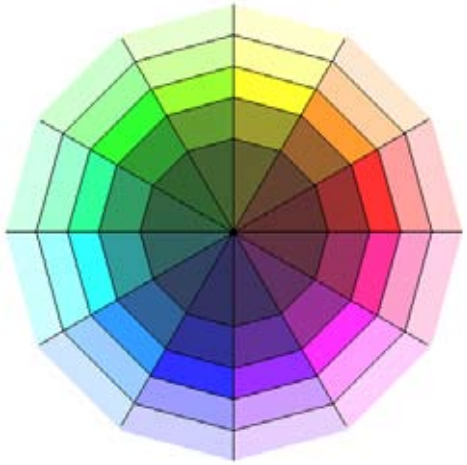
Important Color Consideration



With the great selection of full color stock photographs readily-available at a reasonable cost on the Internet, it is tempting to always include them in your document. But we know there will be times when your budget doesn't allow for full color printing. For those instances, we offer these tips:

- *Use color as a separator.* Print lines (also known as *rules*) or selected graphic elements in a single color. Put a colored screen or tint behind a block of text that you want to highlight. Print a *pull quote* in color.
- *Print photographs in gray scale.* Black and white photographs can make a strong visual statement, especially when cropped in an unusual fashion. Photographs that highlight patterns or textures might even be more effective in black and white.
- *Use color sparingly.* Just as we recommend using no more than two or three fonts in a document, we recommend using only one or two colors in addition to black. Remember, too, that text is easier to read when there is good contrast between the ink and paper color. For this reason, we recommend using black or dark ink for body copy.