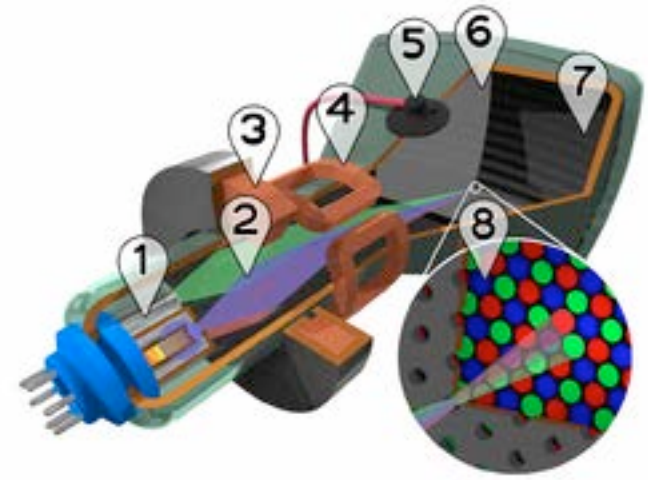
Color Systems at Use

RGB

- Additive color model in which red, green, and blue light are added together in various ways to reproduce a broad array of colors.

- Projectors
- TV screens



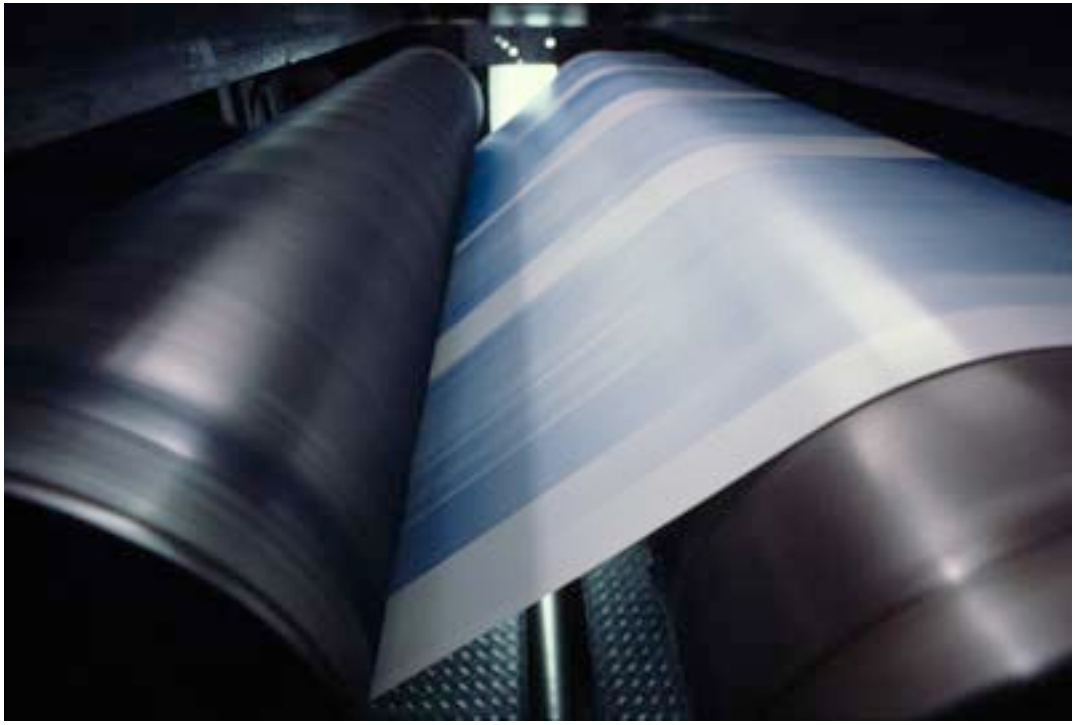
- Printing, drawing and painting uses pigments, not light to deposit color

Subtractive Color System: Pigments

- The three primary colors of paint are red, blue and yellow.

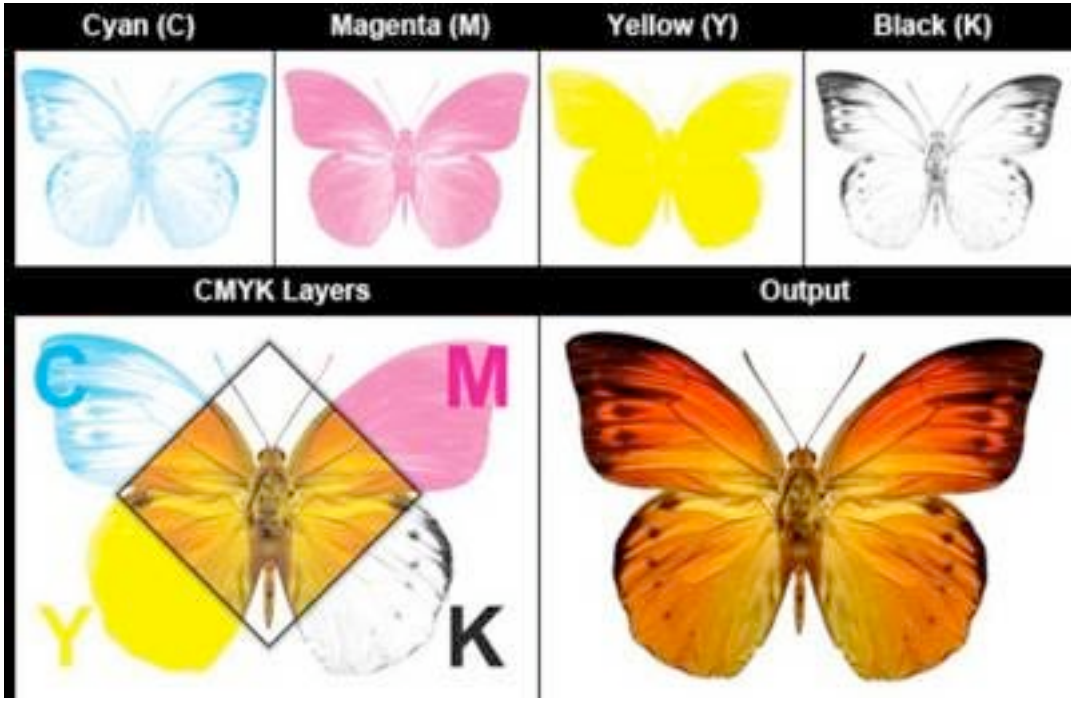
- These colors combine to give you a neutral grayish muddy color.
- In the ideal world, they would combine and form black.

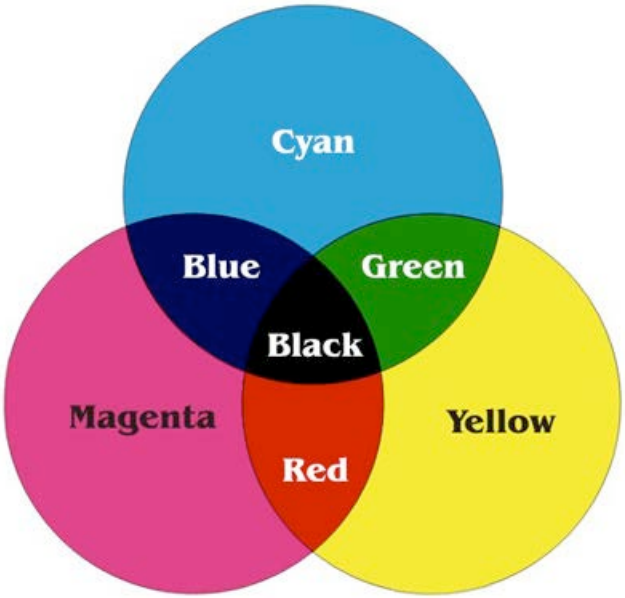
- Printing press:
- Top: plate
- Middle: transfer blanket
- Bottom: paper



Printing press

- Prints one color at a time
- One color over another
- Full color: 4 color process (process color)





- Two systems have been devised for translating hundreds of color variations into formulas for mixing printing ink.
- They are the *Process Color* system and *Pantone Matching System (PMS).*

The process color system

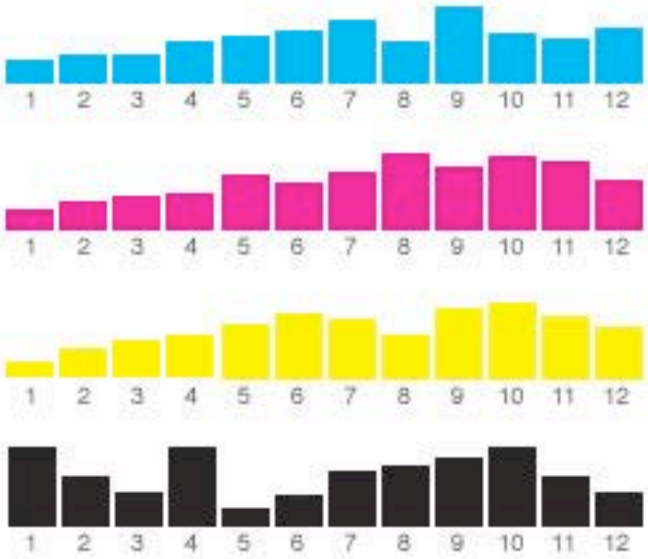
- is used to reproduce realistic color photos and illustrations regardless of the number of color variations in them.
- Sometimes referred to as the 4-color process or full-color printing, the system uses just four colors, three primaries similar to those on the color wheel (*C*yan, a brilliant greenish blue, *M*agenta, a brilliant violet red, and *Y*ellow) plus blac*K* *(CMYK)*
- The system assumes that the work will be printed on white paper. The white paper provides the white to create tints of each color.

- The semi transparent ink is printed on the page in the form of tiny dots. The viewer's eye, being unable to focus on individual dots, will blur them together so that an overall color is perceived. The effect is enhanced by the fact that the ink colors actually do blend at points where the dots overlap.

- Half-toning screen angles 133dpi (=dots per inch)

Automatic Ink Key Setting

With this feature, the press will automatically supply the correct amount of ink to the ink rollers. This feature is included with all DI Press RIP-Kits.



Full color printing

- Four or more ink colors generally are used and color photos will be printed in realistic color.
- The Process Color System will be used and colors are specified according to the percentage of CMYK in each.
- Only four standard ink colors will be used in the press and colors will mix only in the mind of the viewer.

In the *Pantone Matching System*,

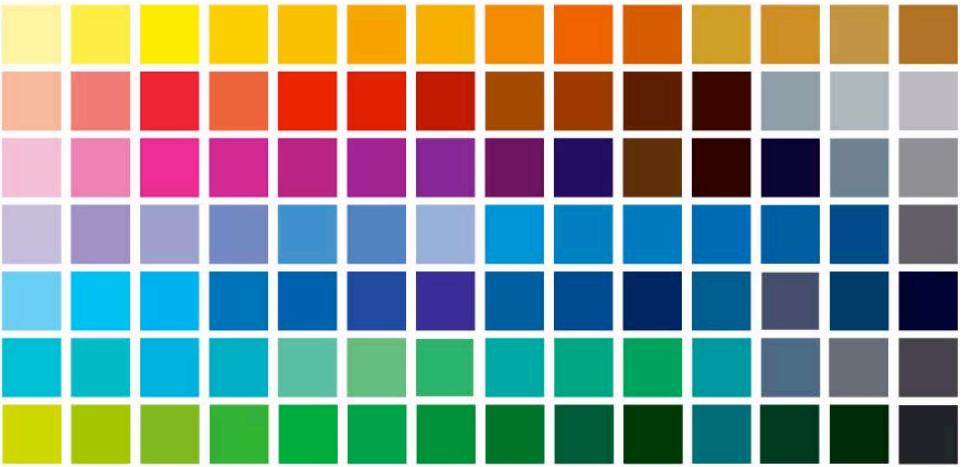
- used for printing spot color, specific colors are created by mixing a variety of standard ink colors including but not limited to the ones used in the process color system.
- Tints can be created not only by printing the ink in dots and allowing some paper to show through but also by mixing white ink with other colors.
- The designer specifies colors by number from a specimen book or chart. It is then the printer's job to worry about making certain that the ink matches the swatch.

Spot color printing

- Fewer than 4 ink colors generally are used in printing and realistic color photos will not be used in the piece.
- The Pantone Matching System is used to designate ink color by PMS numbers.
- Ink colors are mixed to the designer's specifications before the ink is placed in the printing press.

Flat/match/spot color

- More precise than CMYK
- When not necessary to print in full color
- 1, 2, 4, 6 colors
- An additional color used as a design element in a layout
- PMS swatch book
- Mixed out of 9 basic colors



Creating variety with few colors

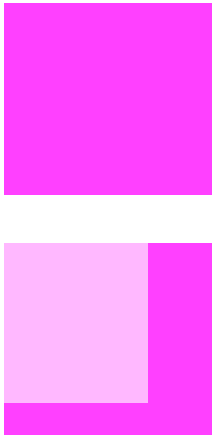
- Even using a limited number of ink colors, two for instance, considerable variety can bee created.
- Especially if the two ink colors are primaries or complimentary colors.
- A full range of tints for each ink color can be created by printing the ink in dots.
- Still more colors can be created by overlapping areas of dots in different proportions and allowing the viewer's eye to blend them.

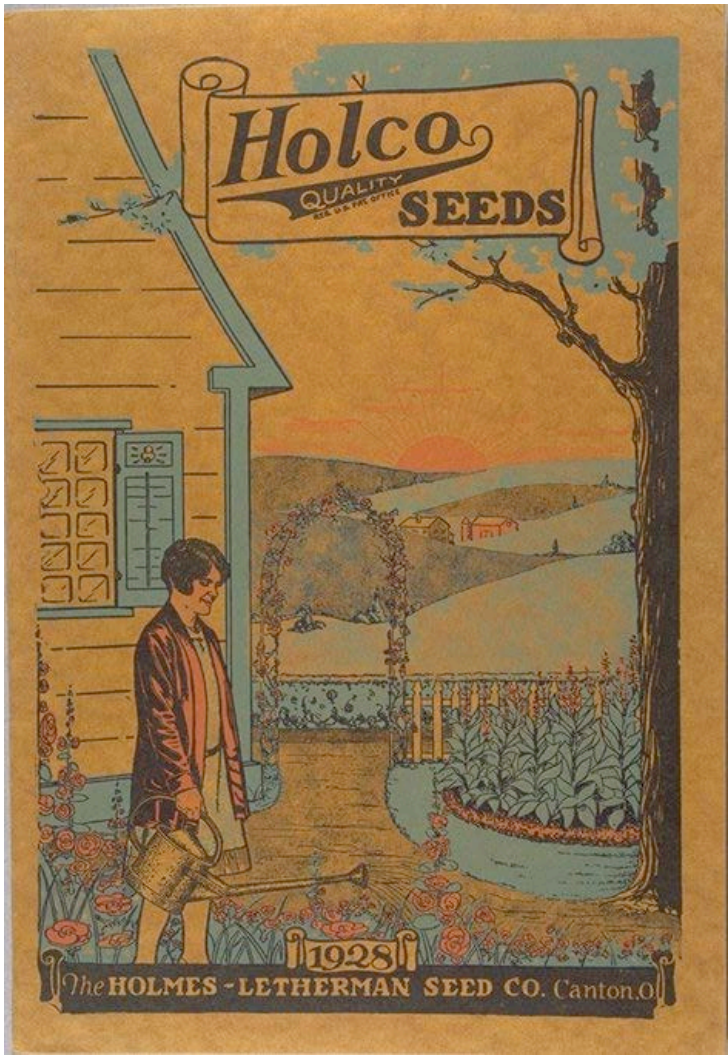
Additional variables

- Choosing to print on a colored paper can further expand the spectrum of a piece printed with spot color.
- In choosing ink and paper colors, designers carefully calculate how they will work together and what additional colors can be created.
- Color decisions must be made especially carefully when printing on colored stock because the transparent ink color may be changed by the paper’s color.

To get more colors without full color printing

- You can use transparency on one color element over another





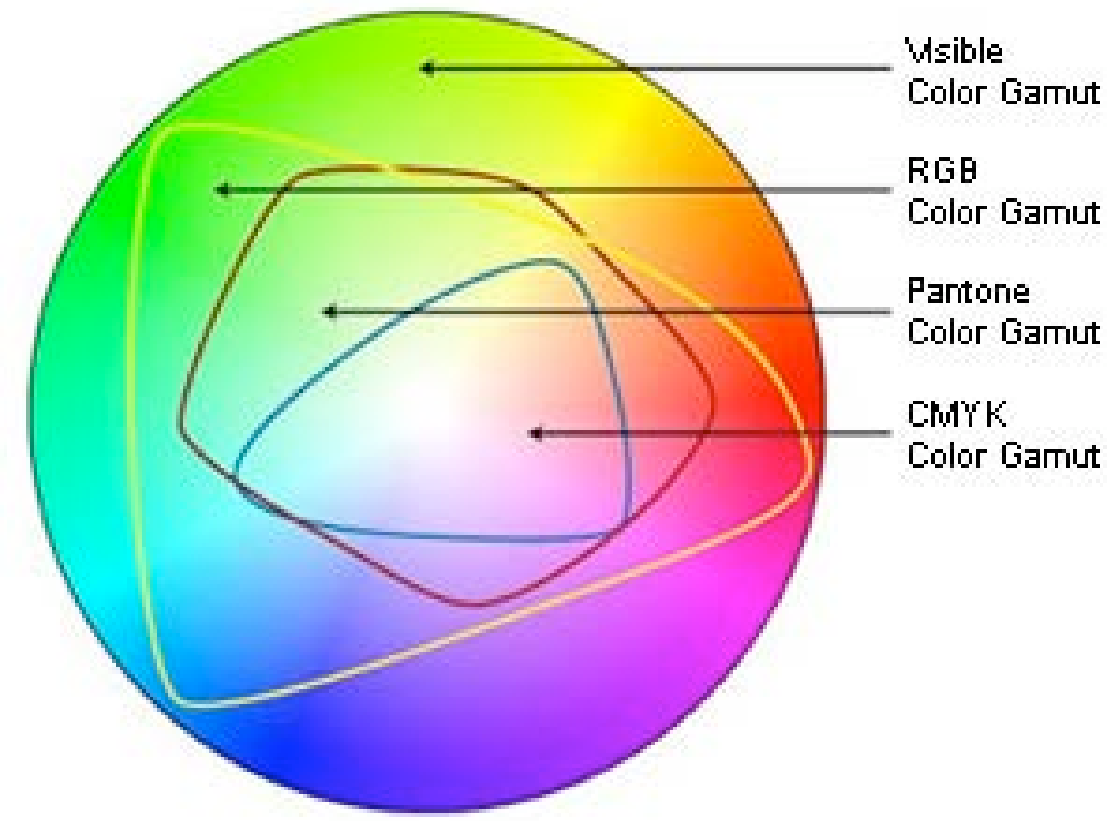
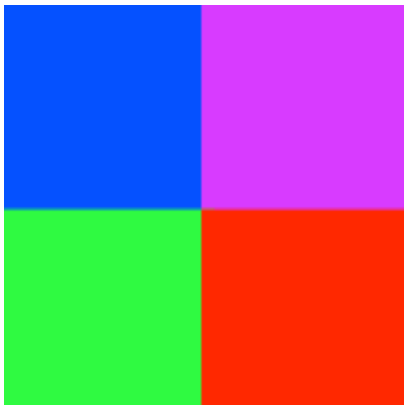
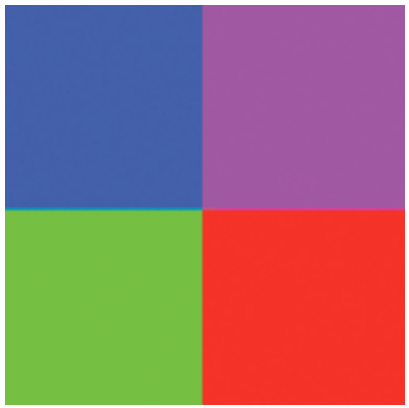
Some principles to keep in mind

- Overlapping flat color slows drying…..>smudging
- Color will change shade when printed over other
- Color will change shade if printed on a color paper
- You cannot print white on an inkjet/laser printer
- You can do so with a commercial printer, they just load the white ink in
- Always deliver your digital images in CMYK-mode to printers, not RGB!

Duotone

- Duo = 2 = uses two colors
- Usually superimposition of a contrasty black halftone over a one-color halftone which is shot with highlights and middle tones

Color systems applied



RGB x CMYK