Comparing RGB and CMYK Color Models[1]1

RGB Color

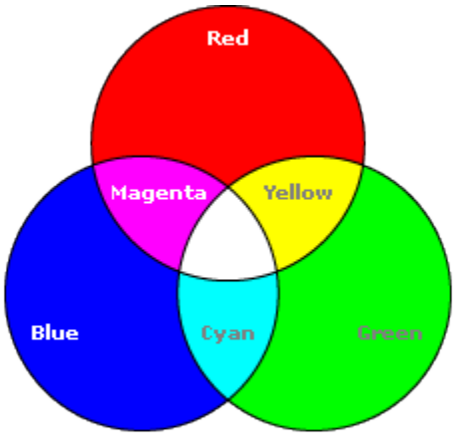

Figure 1 RGB Color Model

The RGB model forms its gamut from the primary additive colors of red, green and blue. When red, green and blue light is combined it forms white. Computers generally display RGB using 24-bit color. In the 24-bit RGB color model there are 256 variations for each of the additive colors of red, green and blue. Therefore there are 16,777,216 possible colors (256 reds x 256 greens x 256 blues) in the 24-bit RGB color model.

In the RGB color model, colors are represented by varying intensities of red, green and blue light. The intensity of each of the red, green and blue components is represented on a scale from 0 to 255 with 0 being the least intensity (no light emitted) to 255 (maximum intensity). For example in the above RGB chart the magenta color would be R=255 G=0 B=255. Black would be R=0 G=0 B=0 (a total absence of light).

CMYK or "Process Color"

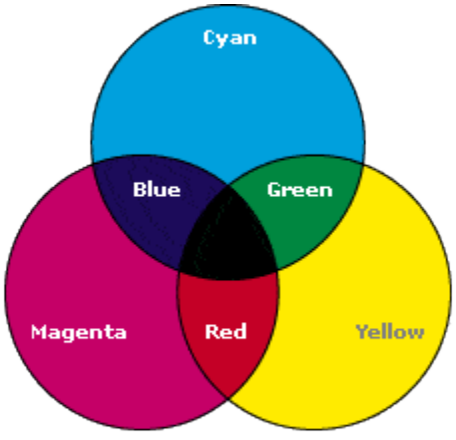

Figure 1 CMYK Color Model

The CMYK printing method is also known as "four-color process" or simply "process" color. All of the colors in the printable portion of the color spectrum can be achieved by overlapping "tints" of cyan, magenta, yellow and black inks. A tint is a screen of tiny dots appearing as a percentage of a solid color. When various tints of the four colors are printed in overlapping patterns it gives the illusion of continuous tones - like a photograph:

The CMYK model forms its gamut from the primary subtractive colors of cyan, magenta and yellow. When cyan, magenta and yellow inks are combined it forms black - in theory. However, because of the impurities in ink, when cyan, magenta and yellow inks are combined it

produces a muddy brown color. Black ink is added to this system to compensate for these impurities.

In the CMYK color model, colors are represented as percentages of cyan, magenta, yellow and black. For example in the above CMYK chart the red color is composed of 14% cyan, 100% magenta, 99% yellow and 3% black. White would be 0% cyan, 0% magenta, 0% yellow and 0% black (a total absence of ink on white paper).

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[1] http://www.sketchpad.net/basics4.htm