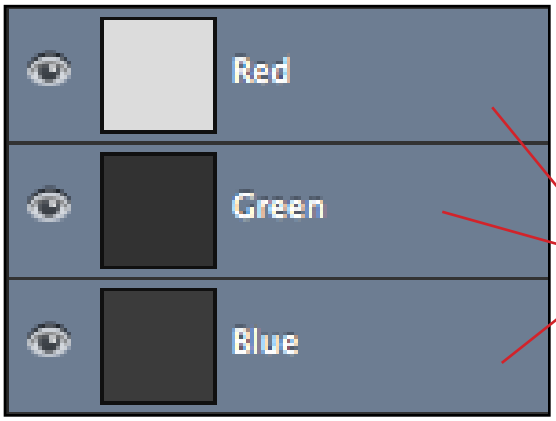
Digital Color

RGB Color - How Monitors Display Color

Computers, monitors, mobile devices - all have no inherent understanding of color. But they do understand light! These devices display color by projecting various ***light values*** through Red, Green, and Blue phosphors. The result is the illusion of full color. Each pixel can emit exactly 256 different levels of light, from no light (black) to full amount of light (white).

256 levels of light each pixel can emit.



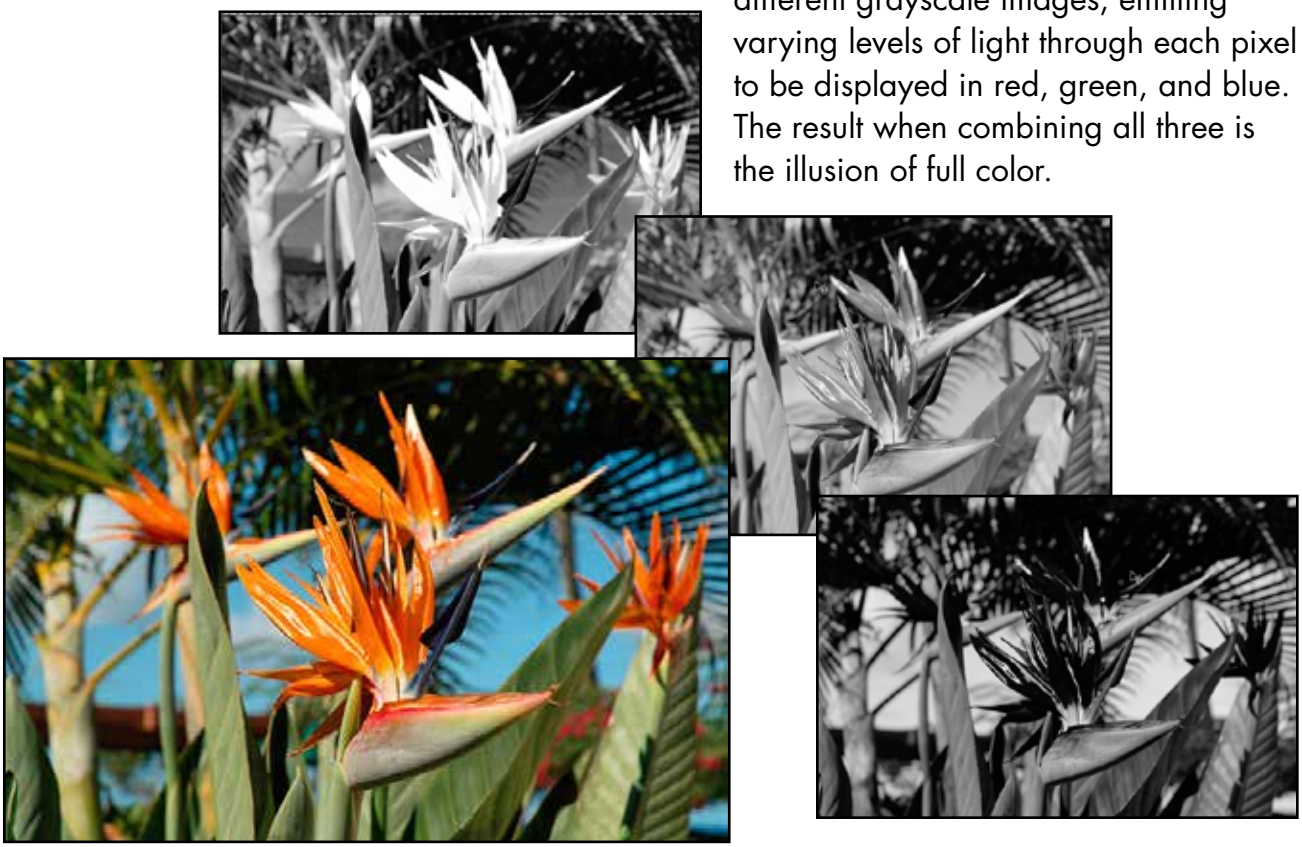
Because each pixel displays 256 levels of light, the numbering system of RGB color is based upon that value; 0 - 256. A low number = less, a higher number = more. Exactly 16,777,216 distinct colors can be generated by this system.

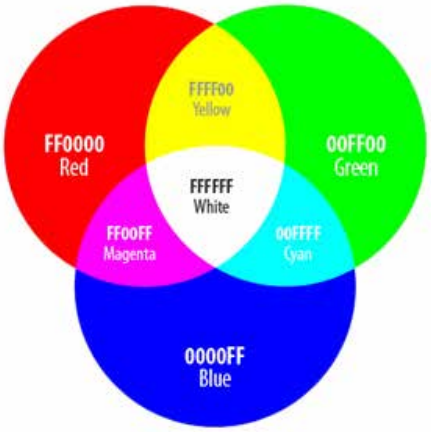
R = 210
G = 35
B = 42

This color swatch appears red because it has a higher value of light emitted through the red, and less of the green and blue light.

Digital Image Color

Digital images are actually three different grayscale images, emitting varying levels of light through each pixel to be displayed in red, green, and blue. The result when combining all three is the illusion of full color.



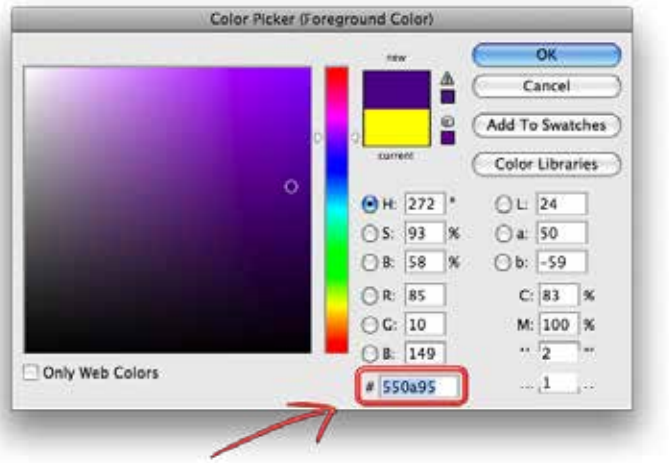


Hexadecimal Value - Hex codes are simply another numeric method of specifying RGB color. This system is based upon multiples of 16. Numbers 0-9 and characters A-F are used to represent RGB values. Each value is represented by a pair of digits. The # sign always precedes a hex code.

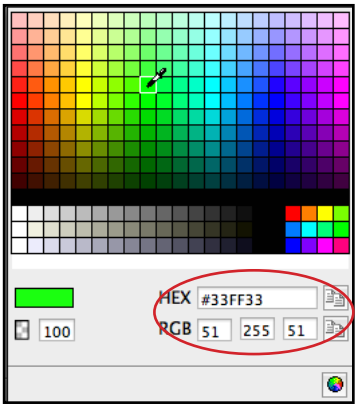
R = D2
G = 23 #D2232A
B = 2A

Although it is not necessary to be able to convert from RGB to Hex code, this table illustrates the relationship between RGB and Hex code numbering systems.

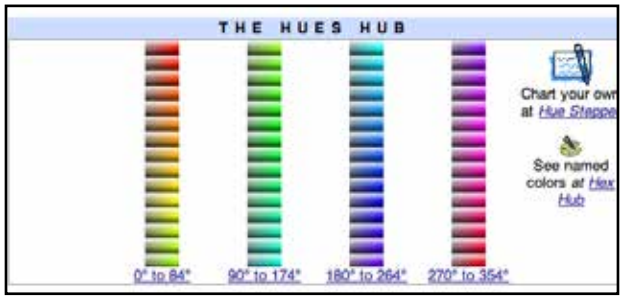
RGB	HEX	RGB	HEX	RGB	HEX
0	00	16	10	32	20
1	01	17	11	33	21
2	02	18	12	34	22
3	03	19	13	35	23
4	04	20	14	...	
5	05	21	15	245	F5
6	06	22	16	246	F6
7	07	23	17	247	F7
8	08	24	18	248	F7
9	09	25	19	249	F8
10	0A	26	1A	250	F9
11	0B	27	1B	251	FA
12	0C	28	1C	252	FB
13	0D	29	1D	253	FC
14	0E	30	1E	254	FE
15	0F	31	1F	255	FF



It is not necessary to memorize or know all of the codes to obtain great color. Just about every graphics application has an hex code indicator in the color picker and/or swatch palette.



Other great resources for choosing hex codes are
http://www.color-hex.com
Hues Hub:
http://www.december.com/html/spec/colorhues.html



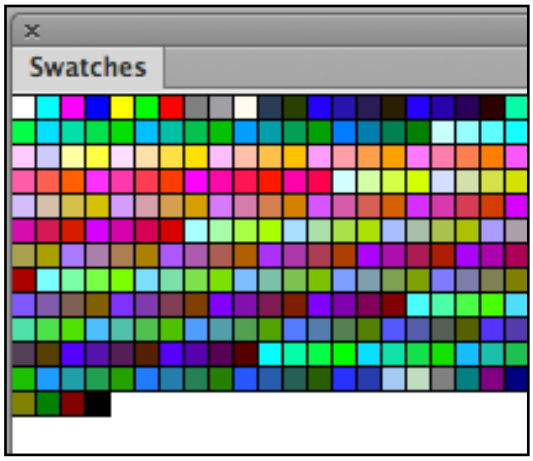
What are "Web Safe" colors?

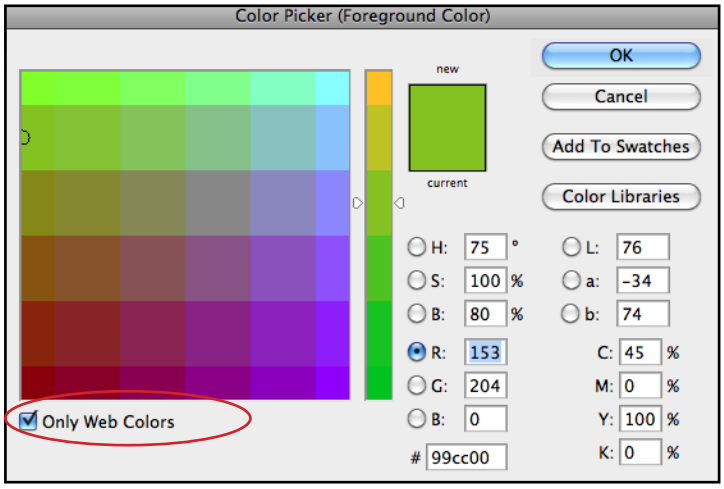
Some years ago, when computers supported max 256 different colors, a list of 216 "Web Safe Colors" was suggested as a Web standard, reserving 40 fixed system colors.

At that time most computers were only capable of displaying a maximum of 256 colors at one time. The 216 cross-browser color palette was created to ensure that all computers would display the colors correctly when running a 256 color palette.

The argument still remains for the use of web-safe color. Some state that the use of Web Safe colors are not as important now, since most computers can display millions of different colors. Others maintain that there are still plenty of old computers out there viewing websites, and that a good developer should develop to the lowest common denominator.

But the choice is left to you.





Adobe Photoshop (top) and Adobe Fireworks (below) both have means to designate a web safe palette for Macintosh and/or PC.