

Safe Web Colors for color-deficient vision

Color Vision Defects

About 8% of (Caucasian) males and 0.5% of females exhibit some form of color vision deficiency. Not taking into account their special needs could mean that 1 out of 20 visitors might not be able to use a website at all or only with great difficulty. Text might be illegible and images unrecognizable.

Designing web pages (or any type of user interface for that matter) for individuals with color vision deficiencies can be a challenge. Descriptions on what colors are confused by individuals with color vision deficiencies are abundant, but difficult to apply in practice. What does it mean that a particular type of color vision deficiency causes individuals to confuse reds and greens? What colors do such individuals actually perceive? There are also many misconceptions and much misinformation about color vision deficiencies in the Human Factors and HCI literature. These make it difficult to pin down specific recommendations.

Two main types of defects can be distinguished: **red-green defects** and **blue-yellow defects**. Red-green defects occur in trichromatic and dichromatic forms. For blue-yellow defects, only a dichromatic form has been generally accepted.

Individuals with red-green defects confuse colors from red through yellow to green. There are two forms of red-green defects: **protan** and **deutan**. Protan defects have a trichromatic form, **protanomaly**, and a dichromatic form, **protanopia**. Deutan defects also have a trichromatic form, **deuteranomaly**, and a dichromatic form, **deuteranopia**.

Individuals with blue-yellow defects confuse colors from yellow through green to blue. There is only a dichromatic form, **tritanopia**. The existence of a trichromatic form, **tritanomaly**, has not been confirmed.

Table 1.

Color vision defects

Type	Form	Cause
Red-Green Defects		
protanomaly	trichromatic	dysfunctional L cones
protanopia	dichromatic	missing L cones
deuteranomaly	trichromatic	dysfunctional M cones
deuteranopia	dichromatic	missing M cones
Blue-Yellow Defects		
tritanopia	dichromatic	missing S cones

Trichromatic forms are thought to be caused by dysfunctional cones. One cone type is assumed to have a spectral sensitivity similar to the sensitivity of another cone type. Dichromatic forms are thought to be caused by missing cones.

- Protanomaly is caused by dysfunctional L (long wavelength, also called red) cones. In this case, L cones have a spectral sensitivity similar to M (medium wavelength or green) cones.
- Protanopia is caused by missing L cones.
- Deuteranomaly is caused by dysfunctional M cones. M cones have a spectral sensitivity similar to L cones.
- Deuteranopia is caused by missing M cones.
- Tritanopia is caused by missing S (short wavelength or blue) cones.

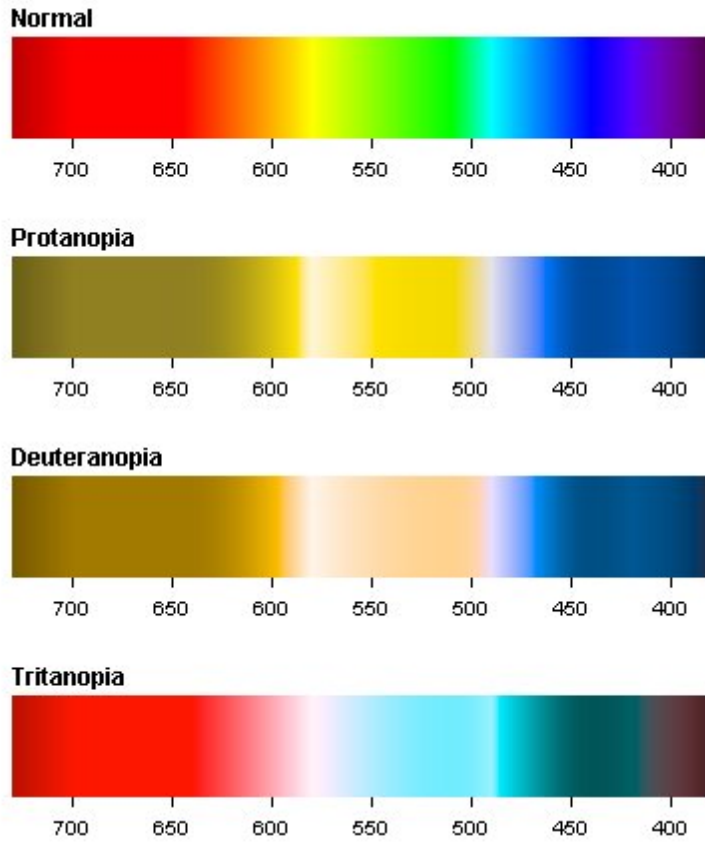
Individuals with protanomaly and protanopia also have a reduced sensitivity to long wavelengths. Reds appear darker than normal.

Table 2.

Type	Incidence (%)	
	Males	Females
protanomaly	1	0.02
protanopia	1	0.02
deuteranomaly	5	0.4
deuteranopia	1	0.01
tritanopia	0.005	0.005
achromatopsia	0.005	0.005

Figure 1.

The spectrum as perceived by individuals with normal color vision, protanopia, deuteranopia and tritanopia



Color transformations - Hexadecimal and Decimal

This table holds the standard 216 color web palette, with an approximation of the hues seen by color deficient dichromats.* [Note that it is not corrected for the loss of luminance experienced by protanopes at the longer wavelengths.]

Full 216 color web palette							
Normal		Protanopia		Deuteranopia		Tritanopia	
Hexadecimal	Decimal RGB	Hexadecimal	Decimal RGB	Hexadecimal	Decimal RGB	Hexadecimal	Decimal RGB
fffff	255 255 255	fffafa	255 250 250	ffe8ef	255 232 239	f4f0ff	244 240 255
ffffcc	255 255 204	fff2c8	255 242 200	ffdfc8	255 223 200	fdefff	253 239 255
ffff99	255 255 153	ffeda2	255 237 162	ffdaad	255 218 173	ffeaf9	255 234 249
ffff66	255 255 102	ffea86	255 234 134	ffd79d	255 215 157	ffe6f5	255 230 245
ffff33	255 255 051	ffe975	255 233 117	ffd594	255 213 148	ffe5f3	255 229 243
ffff00	255 255 000	ffe871	255 232 113	ffd592	255 213 146	ffe4f2	255 228 242

Full 216 color web palette

ffceff	255 204 255	efd7ff	207 215 255	e1d8fd	225 216 253	fd1e1	251 209 225
ffcccc	255 204 204	ded8d2	222 216 210	f1d2cb	241 210 203	ffcad8	255 202 216
ffcc99	255 204 153	e5d69d	229 214 157	fccd99	252 205 153	ffc4d1	255 196 209
ffcc66	255 204 102	e9d469	233 212 105	ffca6f	255 202 111	ffc0cd	255 192 205
ffcc33	255 204 051	ecd435	236 212 053	ffc857	255 200 087	ffbfa	255 191 202
ffcc00	255 204 000	ecd30f	236 211 015	ffc750	255 199 080	ffbeca	255 190 202
ff99ff	255 153 255	aabdff	170 189 255	b0bcf9	176 188 249	f6a9b5	246 169 181
ff99cc	255 153 204	b1b8e0	177 184 224	c5b5c7	197 181 199	fc9faa	252 159 170
ff9999	255 153 153	bdb6a8	189 182 168	d2b095	210 176 149	ff99a2	255 153 162
ff9966	255 153 102	c4b470	196 180 112	daac62	218 172 098	ff959e	255 149 158
ff9933	255 153 051	c7b43a	199 180 058	deab2a	222 171 042	ff949d	255 148 157

Full 216 color web palette

ff9900	255 153 000	c8b317	200 179 023	dfaa00	223 170 000	ff949c	255 148 156
							
ff66ff	255 102 255	98b2ff	152 178 255	85a7f5	133 167 245	f28791	242 135 145
							
ff66cc	255 102 204	82a0f6	130 160 246	a09fc3	160 159 195	f87981	248 121 129
							
ff6699	255 102 153	999db9	153 157 185	b19992	177 153 146	fd6e74	253 110 116
							
ff6666	255 102 102	a59b7c	165 155 124	bb955e	187 149 094	ff666c	255 102 108
							
ff6633	255 102 051	aa9a42	170 154 066	bf9322	191 147 034	ff656a	255 101 106
							
ff6600	255 102 000	ac9a1e	172 154 030	c09300	192 147 000	ff6569	255 101 105
							
ff33ff	255 051 255	96b1ff	150 177 255	679bf2	103 155 242	f07178	240 113 120
							
ff33cc	255 051 204	779dff	119 157 255	8a92c1	138 146 193	f75e63	247 094 099
							
ff3399	255 051 153	7a8ece	122 142 206	9d8b8f	157 139 143	fb4c4f	251 076 079
							
ff3366	255 051 102	8f8c8b	143 140 139	a7875c	167 135 092	fe3d3e	254 061 062
							

Full 216 color web palette

ff3333	255 051 051	988b4a	152 139 074	ad841c	173 132 028	ff3332	255 051 050
ff3300	255 051 000	9a8b23	154 139 035	ae8600	174 134 000	ff3331	255 051 049
ff00ff	255 000 255	96b1ff	150 177 255	5e98f1	094 152 241	f06a71	240 106 113
ff00cc	255 000 204	7ba0ff	123 160 255	838fc0	131 143 192	f6555a	246 085 090
ff0099	255 000 153	6e89d7	110 137 215	97888e	151 136 142	fa4042	250 064 066
ff0066	255 000 102	888892	136 136 146	a2835b	162 131 091	fd2b28	253 043 040
ff0033	255 000 051	93874e	147 135 078	a8801a	168 128 026	fe1a00	254 026 000
ff0000	255 000 000	968726	150 135 038	a98200	169 130 000	fe1c00	254 028 000
ccffff	204 255 255	f8f4f8	248 244 248	ffeafd	255 234 253	cbefff	203 239 255
ccffcc	204 255 204	fff1c5	255 241 197	ffdecc	255 222 204	d3efff	211 239 255
ccff99	204 255 153	ffeb97	255 235 151	ffd8ab	255 216 171	d9eeff	217 238 255

Full 216 color web palette

cff66	204 255 102	ffe873	255 232 115	ffd497	255 212 151	ddeeff	221 238 255
cff33	204 255 051	ffe75c	255 231 092	ffd38c	255 211 140	e0eeff	224 238 255
cff00	204 255 000	ffe655	255 230 085	ffd389	255 211 137	e0eeff	224 238 255
ccccff	204 204 255	c4ceff	196 206 255	cbceff	203 204 255	c6d1e1	198 209 225
cccccc	204 204 204	cfcbcb	207 203 203	dec6cd	222 198 205	cecad9	206 202 217
cccc99	204 204 153	d7c997	215 201 151	eac19b	234 193 155	d3c4d3	211 196 211
cccc66	204 204 102	dbc764	219 199 100	f1be6a	241 190 106	d7c1cf	215 193 207
cccc33	204 204 051	ddc631	221 198 049	f5bc3b	245 188 059	d8bfcd	216 191 205
cccc00	204 204 000	ddc600	221 198 000	f6c600	246 198 000	d9becc	217 190 204
cc99ff	204 153 255	98b1ff	152 177 255	8faefb	143 174 251	bfa9b6	191 169 182
cc99cc	204 153 204	9ea8d7	158 168 215	aaa7c9	170 167 201	c79fab	199 159 171

Full 216 color web palette

cc9999	204 153 153	aaa5a0	170 165 160	baa198	186 161 152	cd98a2	205 152 162
cc9966	204 153 102	b1a46a	177 164 106	c49d65	196 157 101	d0929d	208 146 157
cc9933	204 153 051	b5a336	181 163 054	c99b32	201 155 050	d2909a	210 144 154
cc9900	204 153 000	b5a20e	181 162 014	ca9a00	202 154 000	d38f99	211 143 153
cc66ff	204 102 255	87a7ff	135 167 255	4c97f6	076 151 246	bb8791	187 135 145
cc66cc	204 102 204	648ceb	100 140 235	7b8dc5	123 141 197	c37982	195 121 130
cc6699	204 102 153	7f88af	127 136 175	918694	145 134 148	c96e75	201 110 117
cc6666	204 102 102	8c8675	140 134 117	9e8161	158 129 097	cc656c	204 101 108
cc6633	204 102 051	92853c	146 133 060	a47e2b	164 126 043	ce6067	206 096 103
cc6600	204 102 000	948415	148 132 021	a67f00	166 127 000	cf5f65	207 095 101
cc33ff	204 051 255	8aaaff	138 170 255	008def	000 141 239	b87178	184 113 120

Full 216 color web palette

cc33cc	204 051 204	4387ff	067 135 255	577ec2	087 126 194	c15e64	193 094 100
cc3399	204 051 153	5275c8	082 117 200	767591	118 117 145	c64c50	198 076 080
cc3366	204 051 102	707387	112 115 135	856f5f	133 111 095	ca3d3f	202 061 063
cc3333	204 051 051	7b7146	123 113 070	8c6c27	140 108 039	cc3334	204 051 052
cc3300	204 051 000	7e711b	126 113 027	8f6d00	143 109 000	cc3030	204 048 048
cc00ff	204 000 255	8cabff	140 171 255	008cec	000 140 236	b76a71	183 106 113
cc00cc	204 000 204	5d91ff	093 145 255	4b7ac0	075 122 192	c0555a	192 085 090
cc0099	204 000 153	356fd5	053 111 213	6e7190	110 113 144	c64043	198 064 067
cc0066	204 000 102	646d90	100 109 144	7e6a5e	126 106 094	ca2b2b	202 043 043
cc0033	204 000 051	746c4c	116 108 076	856726	133 103 038	cb170b	203 023 011
cc0000	204 000 000	786c1e	120 108 030	886900	136 105 000	cc1600	204 022 000

Full 216 color web palette

99ffff	153 255 255	efecf4	239 236 244	f4e4ff	244 228 255	a6efff	166 239 255
99ffcc	153 255 204	f7e9c1	247 233 193	ffddd0	255 221 208	acefff	172 239 255
99ff99	153 255 153	fbe790	251 231 144	ffd6a9	255 214 169	b0eeff	176 238 255
99ff66	153 255 102	fee65e	254 230 094	ffd291	255 210 145	b4eeff	180 238 255
99ff33	153 255 051	ffe532	255 229 050	ffd184	255 209 132	b5edff	181 237 255
99ff00	153 255 000	ffe41c	255 228 028	ffd080	255 208 128	b6edff	182 237 255
99ccff	153 204 255	b9c5fa	185 197 250	b9c4ff	185 196 255	91d1e1	145 209 225
99cccc	153 204 204	c4c1c6	196 193 198	cebdcf	206 189 207	9ccad9	156 202 217
99cc99	153 204 153	cbbf93	203 191 147	dbb89d	219 184 157	a3c4d3	163 196 211
99cc66	153 204 102	cfbd61	207 189 097	e4b56c	228 181 108	a8c1cf	168 193 207
99cc33	153 204 051	d1bc2f	209 188 047	e8b33f	232 179 063	aabfcd	170 191 205

Full 216 color web palette

99cc00	153 204 000	d2bc00	210 188 000	e9b22a	233 178 042	abbecc	171 190 205
9999ff	153 153 255	83a4ff	131 164 255	6fa4fd	111 164 253	86a9b6	134 169 182
9999cc	153 153 204	8f9cce	143 156 206	929bcc	146 155 204	929fab	146 159 171
999999	153 153 153	9b9899	155 152 153	a6949a	166 148 154	9a97a3	154 151 163
999966	153 153 102	a29665	162 150 101	b29068	178 144 104	9f929d	159 146 157
999933	153 153 051	a59532	165 149 050	b78e37	183 142 055	a2909a	162 144 154
999900	153 153 000	a69500	166 149 000	a69500	166 149 000	a28f99	162 143 153
9966ff	153 102 255	709bff	112 155 255	0090f3	000 144 243	7e8791	126 135 145
9966cc	153 102 204	497bdf	073 123 223	507fc7	080 127 199	8c7982	140 121 130
996699	153 102 153	6a77a5	106 119 165	737696	115 118 150	946d75	148 109 117
996666	153 102 102	78746d	120 116 109	847064	132 112 100	9a656c	154 101 108

Full 216 color web palette

996633	153 102 051	7e7237	126 114 055	8c6d31	140 109 049	9c6067	156 096 103
996600	153 102 000	7f720d	127 114 013	8e6c00	142 108 000	9d5f66	157 095 102
9933ff	153 051 255	7da2ff	125 162 255	008de8	000 141 232	7a7078	122 112 120
9933cc	153 051 204	007af6	000 122 246	0073c2	000 115 194	885d64	136 093 100
993399	153 051 153	005ebf	000 094 191	496192	073 097 146	914c51	145 076 081
993366	153 051 102	505b80	080 091 128	625961	098 089 097	963d40	150 061 064
993333	153 051 051	5f5941	095 089 065	6c552d	108 085 045	993335	153 051 053
993300	153 051 000	635913	099 089 019	705600	112 086 000	9a3032	154 048 050
9900ff	153 000 255	83a6ff	131 166 255	008ce5	000 140 229	796a71	121 106 113
9900cc	153 000 204	2782ff	039 130 255	0073c0	000 115 192	87555b	135 085 091
990099	153 000 153	0067d0	000 103 208	385b90	056 091 144	904044	144 064 068

Full 216 color web palette

990066	153 000 102	39538f	057 083 143	57535f	087 083 095	962b2c	150 043 044
990033	153 000 051	55514a	085 081 074	634e2c	099 078 044	981612	152 022 018
990000	153 000 000	5a5117	090 081 023	674f00	103 079 000	991100	153 017 000
66ffff	102 255 255	eae7f0	234 231 240	ebdfff	235 223 255	88efff	136 239 255
66ffcc	102 255 204	f1e4bf	241 228 191	ffddd3	255 221 211	8befff	139 239 255
66ff99	102 255 153	f6e28d	246 226 141	ffd5a7	255 213 167	8eefff	142 238 255
66ff66	102 255 102	f8e15d	248 225 093	ffd08b	255 208 139	90eeff	144 238 255
66ff33	102 255 051	fae02a	250 224 042	ffc7c	255 207 124	92edff	146 237 255
66ff00	102 255 000	fae000	250 224 000	ffce79	255 206 121	92edff	146 237 255
66ccff	102 204 255	b2bef5	178 190 245	adbeff	173 190 255	57d1e1	087 209 225
66cccc	102 204 204	bdbbc1	189 187 193	c3b7d1	195 183 209	6bcad9	107 202 217

Full 216 color web palette

66cc99	102 204 153	c4b88f	196 184 143	d2b29f	210 178 159	77c4d3	119 196 211
66cc66	102 204 102	c8b65e	200 182 094	daae6e	218 174 110	7ec1cf	126 193 207
66cc33	102 204 051	cab52d	202 181 045	dfac42	223 172 066	81bfcd	129 191 205
66cc00	102 204 000	cab500	202 181 000	e0ac2e	224 172 046	82becd	130 190 205
6699ff	102 153 255	6e98fe	110 152 254	519cfe	081 156 254	3ea9b6	062 169 182
6699cc	102 153 204	8593c7	133 147 199	8093cd	128 147 205	5a9fab	090 159 171
669999	102 153 153	918f93	145 143 147	978c9c	151 140 156	6997a3	105 151 163
669966	102 153 102	988c61	152 140 097	a4876a	164 135 106	71929d	113 146 157
669933	102 153 051	9b8b2f	155 139 047	aa853b	170 133 059	74909a	116 144 154
669900	102 153 000	9b8b00	155 139 000	ac8421	172 132 033	758f9a	117 143 154
6666ff	102 102 255	518dff	081 141 255	0090ee	000 144 238	228791	034 135 145

Full 216 color web palette

6666cc	102 102 204	326ed5	050 110 213	0076c9	000 118 201	4d7982	077 121 130
666699	102 102 153	59699c	089 105 156	586a98	088 106 152	5e6d75	094 109 117
666666	102 102 102	686666	104 102 102	6f6367	111 099 103	67656c	103 101 108
666633	102 102 051	6d6432	109 100 050	795f35	121 095 053	6b6067	107 096 103
666600	102 102 000	6f6300	111 099 000	7b5e11	123 094 017	6c5f66	108 095 102
6633ff	102 051 255	6e9aff	110 154 255	008ce4	000 140 228	007179	000 113 121
6633cc	102 051 204	0074ea	000 116 234	0076c2	000 118 194	445d64	068 093 100
663399	102 051 153	0059b4	000 089 180	005995	000 089 149	584c51	088 076 081
663366	102 051 102	324676	050 070 118	3d4763	061 071 099	623d41	098 061 065
663333	102 051 051	46433a	070 067 058	4f4031	079 064 049	663336	102 051 054
663300	102 051 000	4a420b	074 066 011	534000	083 064 000	673033	103 048 051

Full 216 color web palette

6600ff	102 000 255	7aa1ff	122 161 255	008be1	000 139 225	006b73	000 107 115
6600cc	102 000 204	007cf8	000 124 248	0076bf	000 118 191	42545b	066 084 091
660099	102 000 153	0065ca	000 101 202	005a94	000 090 148	563f44	086 063 068
660066	102 000 102	00478e	000 071 142	253d60	037 061 096	602b2d	096 043 045
660033	102 000 051	323748	050 055 072	3f352f	063 053 047	651615	101 022 021
660000	102 000 000	3c360f	060 054 015	453500	069 053 000	660b00	102 011 000
33ffff	051 255 255	e7e5ef	231 229 239	e7ddff	231 221 255	74efff	116 239 255
33ffcc	051 255 204	eee2bd	238 226 189	fcdbd4	252 219 212	76efff	118 239 255
33ff99	051 255 153	f3df8c	243 223 140	ffd4a6	255 212 166	78eeff	120 238 255
33ff66	051 255 102	f5de5c	245 222 092	ffc888	255 207 136	79eeff	121 238 255
33ff33	051 255 051	f7dd29	247 221 041	ffcd78	255 205 120	7aedff	122 237 255

Full 216 color web palette

33ff00	051 255 000	f7dd00	247 221 000	ffcd74	255 205 116	7aedff	122 237 255
33ccff	051 204 255	aebbf2	174 187 242	a7bbff	167 187 255	00d1e0	000 209 224
33cccc	051 204 204	b9b7bf	185 183 191	bdb4d1	189 180 209	3ecad9	062 202 217
33cc99	051 204 153	c0b48e	192 180 142	ccaea0	204 174 160	54c4d3	084 196 211
33cc66	051 204 102	c4b25d	196 178 093	d6ab6f	214 171 111	5ec1cf	094 193 207
33cc33	051 204 051	c6b22c	198 178 044	daa943	218 169 067	63bfcd	099 191 205
33cc00	051 204 000	c6b100	198 177 000	dba830	219 168 048	64bfd7	100 191 215
3399ff	051 153 255	6993fa	105 147 250	3999ff	057 153 255	00abb7	000 171 183
3399cc	051 153 204	7f8ec3	127 142 195	758fce	117 143 206	00a0ac	000 160 172
339999	051 153 153	8c8a90	140 138 144	8f879d	143 135 157	3997a3	057 151 163
339966	051 153 102	92875e	146 135 094	9d826b	157 130 107	49929d	073 146 157

Full 216 color web palette

339933	051 153 051	95862e	149 134 046	a4803c	164 128 060	4f909a	079 144 154
339900	051 153 000	958600	149 134 000	a58600	165 134 000	518f9a	081 143 154
3366ff	051 102 255	2581ff	037 129 255	0090ec	000 144 236	009099	000 144 153
3366cc	051 102 204	2067cd	032 103 205	0078c9	000 120 201	007f87	000 127 135
336699	051 102 153	506195	080 097 149	43639a	067 099 154	146d76	020 109 118
336666	051 102 102	5e5d61	094 093 097	615b68	097 091 104	35656d	053 101 109
336633	051 102 051	645b2f	100 091 047	6d5737	109 087 055	3f6068	063 096 104
336600	051 102 000	655b00	101 091 000	705617	112 086 023	415f66	065 095 102
3333ff	051 051 255	6094ff	096 148 255	008ce2	000 140 226	008187	000 129 135
3333cc	051 051 204	0070e1	000 112 225	0078c2	000 120 194	006a70	000 106 112
333399	051 051 153	0054aa	000 084 170	005d99	000 093 153	005056	000 080 086

Full 216 color web palette

333366	051 051 102	19376a	025 055 106	003b65	000 059 101	263c41	038 060 065
333333	051 051 051	343333	052 051 051	373133	055 049 051	333236	051 050 054
333300	051 051 000	373200	055 050 000	3d2f09	061 047 009	363033	054 048 051
3300ff	051 000 255	739dff	115 157 255	008bdf	000 139 223	007c82	000 124 130
3300cc	051 000 204	0079f2	000 121 242	0076bf	000 118 191	006469	000 100 105
330099	051 000 153	0062c4	000 098 196	005d96	000 093 150	00474b	000 071 075
330066	051 000 102	00468b	000 070 139	003f67	000 063 103	212a2d	033 042 045
330033	051 000 051	002448	000 036 072	131e30	019 030 048	301517	048 021 023
330000	051 000 000	1e1b08	030 027 008	221a00	034 026 000	330600	051 006 000
00ffff	000 255 255	e6e4ee	230 228 238	e6dcff	230 220 255	6eefff	110 239 255
00ffcc	000 255 204	ede1bd	237 225 189	fbdad4	251 218 212	70efff	112 239 255

Full 216 color web palette

00ff99	000 255 153	f2df8c	242 223 140	ffd3a6	255 211 166	72eeff	114 238 255
00ff66	000 255 102	f5dd5c	245 221 092	ffc87	255 207 135	73eeff	115 238 255
00ff33	000 255 051	f6dd29	246 221 041	ffd77	255 205 119	73edff	115 237 255
00ff00	000 255 000	f6dc00	246 220 000	ffd72	255 205 114	73edff	115 237 255
00ccff	000 204 255	adbaf2	173 186 242	a5bbff	165 187 255	00d0df	000 208 223
00cccc	000 204 204	b8b6bf	184 182 191	bbb3d1	187 179 209	29cad9	041 202 217
00cc99	000 204 153	bfb38d	191 179 141	cbaea0	203 174 160	47c4d3	071 196 211
00cc66	000 204 102	c3b25d	195 178 093	d4aa6f	212 170 111	54c1cf	084 193 207
00cc33	000 204 051	c5b12b	197 177 043	d9a844	217 168 068	59bfcd	089 191 205
00cc00	000 204 000	c5b000	197 176 000	daa831	218 168 049	5abfcd	090 191 205
0099ff	000 153 255	6792f8	103 146 248	3398ff	051 152 255	00acb7	000 172 183

Full 216 color web palette

0099cc	000 153 204	7e8dc2	126 141 194	728ecf	114 142 207	00a1ac	000 161 172
009999	000 153 153	8a898f	138 137 143	8d869d	141 134 157	1f97a3	031 151 163
009966	000 153 102	90865e	144 134 094	9b816c	155 129 108	39929d	057 146 157
009933	000 153 051	93852d	147 133 045	a27e3d	162 126 061	42909a	066 144 154
009900	000 153 000	948500	148 133 000	a37e25	163 126 037	448f9a	068 143 154
0066ff	000 102 255	007efe	000 126 254	0090ec	000 144 236	00929a	000 146 154
0066cc	000 102 204	1a66cc	026 102 204	0078c9	000 120 201	00828a	000 130 138
006699	000 102 153	4e5f93	078 095 147	3d629a	061 098 154	00727a	000 114 122
006666	000 102 102	5c5b5f	092 091 095	5e5a69	094 090 105	15656d	021 101 109
006633	000 102 051	61592e	097 089 046	6a5538	106 085 056	2a6068	042 096 104
006600	000 102 000	635800	099 088 000	6d5418	109 084 024	2d5f66	045 095 102

Full 216 color web palette

0033ff	000 051 255	5b91ff	091 145 255	008ce2	000 140 226	008389	000 131 137
0033cc	000 051 204	006fde	000 111 222	0078c2	000 120 194	006f74	000 111 116
003399	000 051 153	0053a6	000 083 166	005e9a	000 094 154	00595e	000 089 094
003366	000 051 102	0d3366	013 051 102	003e68	000 062 104	004347	000 067 071
003333	000 051 051	2e2e30	046 046 048	2f2d34	047 045 052	0a3236	010 050 054
003300	000 051 000	312c00	049 044 000	362a0c	054 042 012	173033	023 048 051
0000ff	000 000 255	719cff	113 156 255	008bdf	000 139 223	007f85	000 127 133
0000cc	000 000 204	0078f0	000 120 240	0076be	000 118 190	006a6e	000 106 110
000099	000 000 153	0060c1	000 096 193	005e97	000 094 151	005155	000 081 085
000066	000 000 102	004487	000 068 135	004168	000 065 104	003739	000 055 057
000033	000 000 051	002346	000 035 070	002135	000 033 053	001c1d	000 028 029
000000	000 000 000	000000	000 000 000	000000	000 000 000	000000	000 000 000