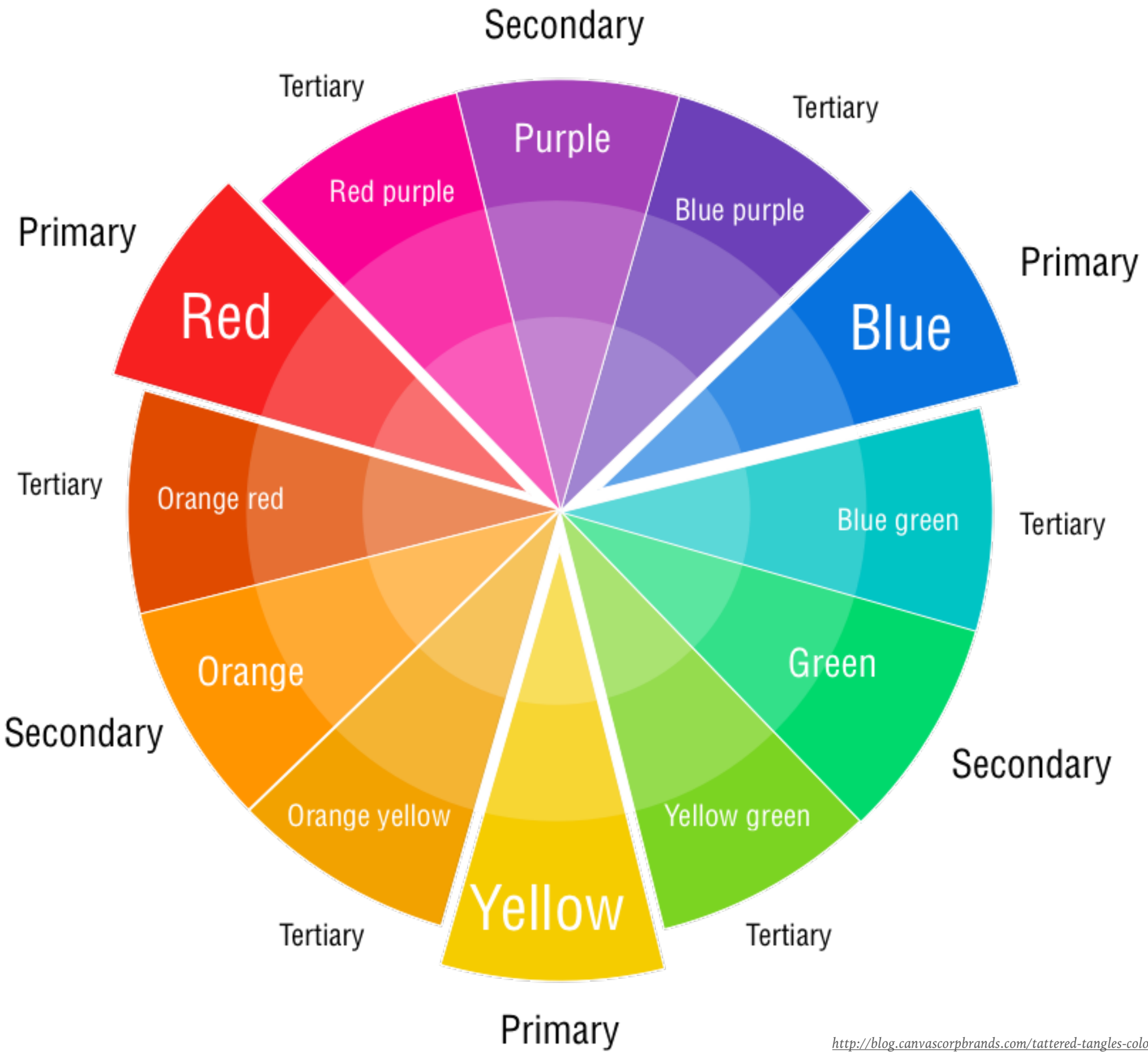
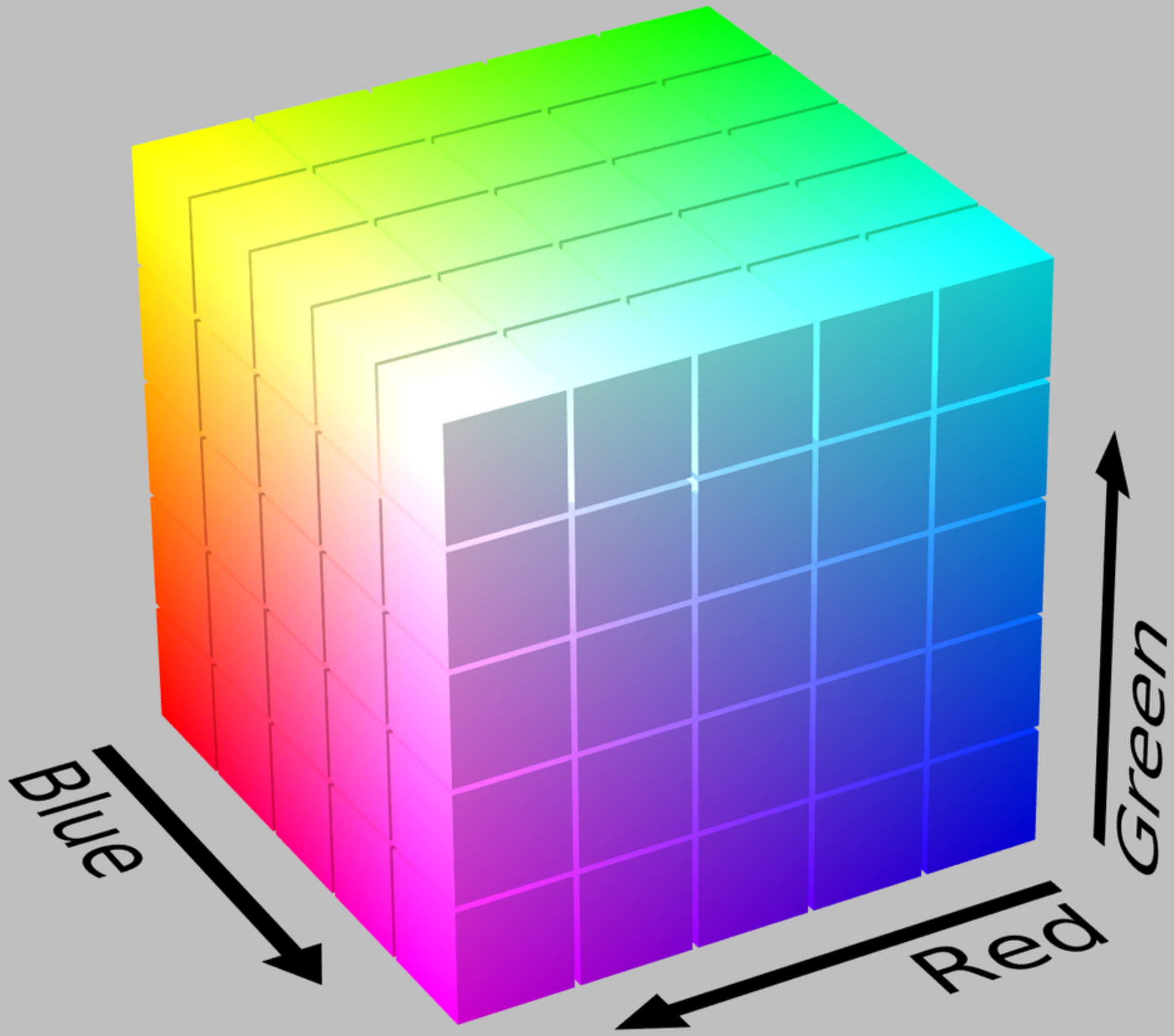
Color

Fall 2024

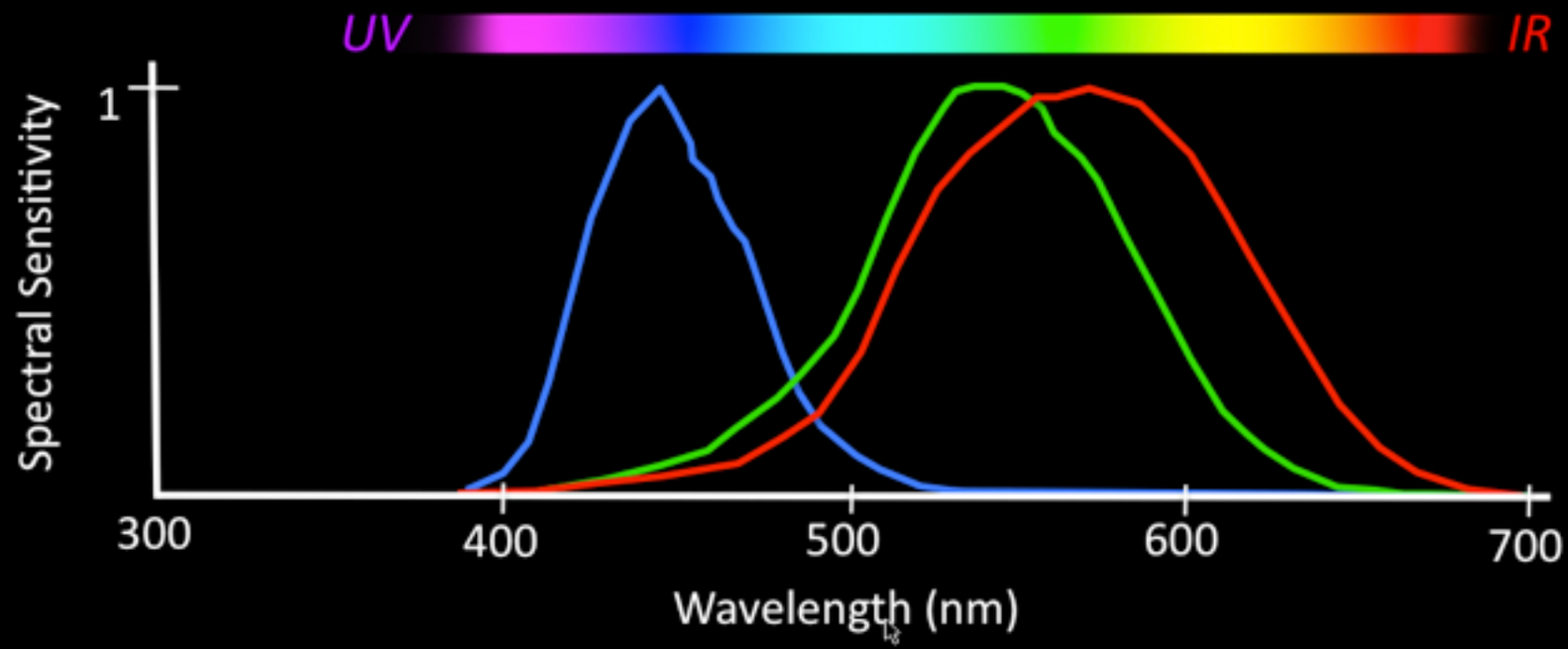


http://blog.canvascorpbrands.com/tattered-tangles-color-me-cards-book-tags/



RGB Cube, SharkD

Homo sapiens



Marshall *et al.,* 2007; Marshall and Oberwinkler, 1999

CRT Displays

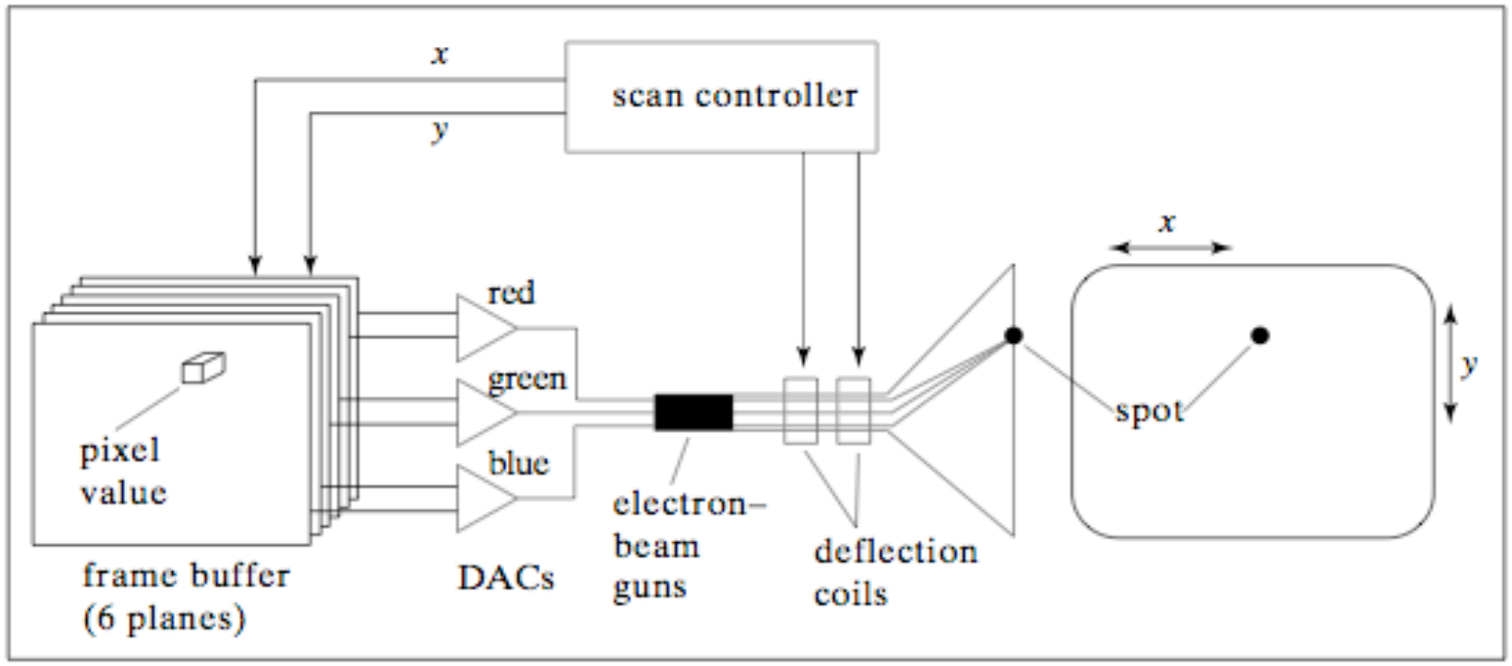
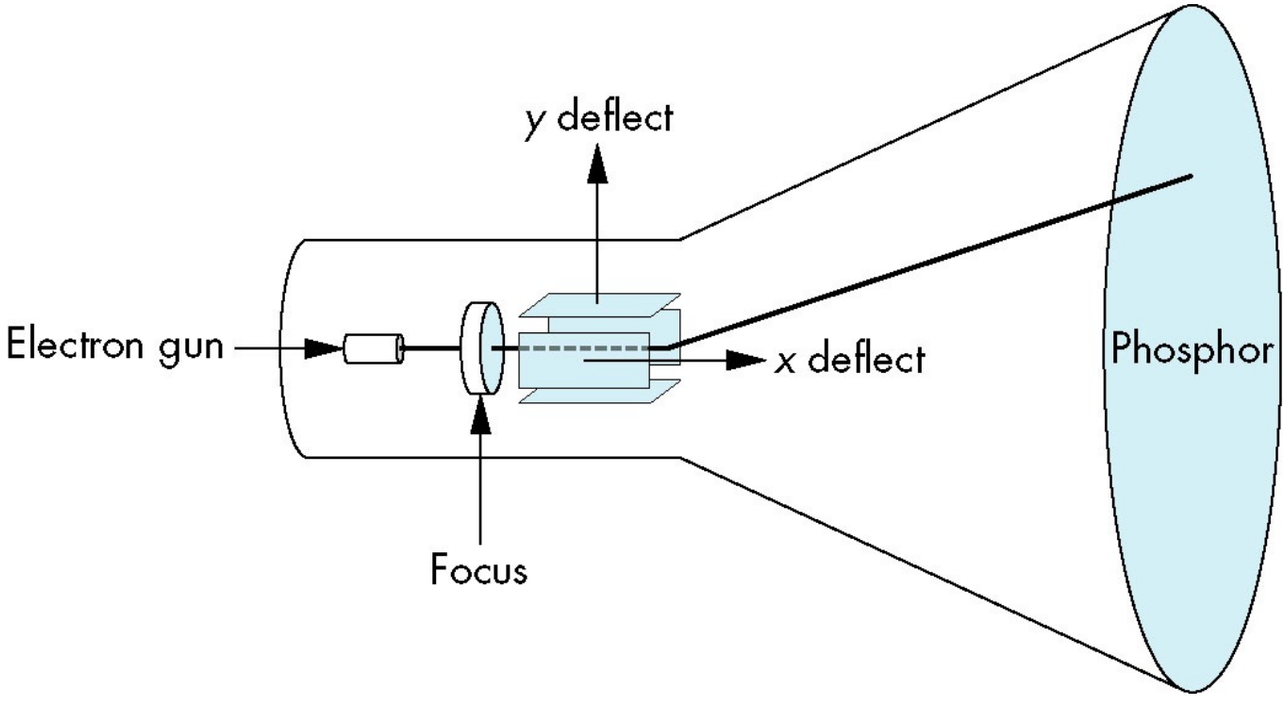
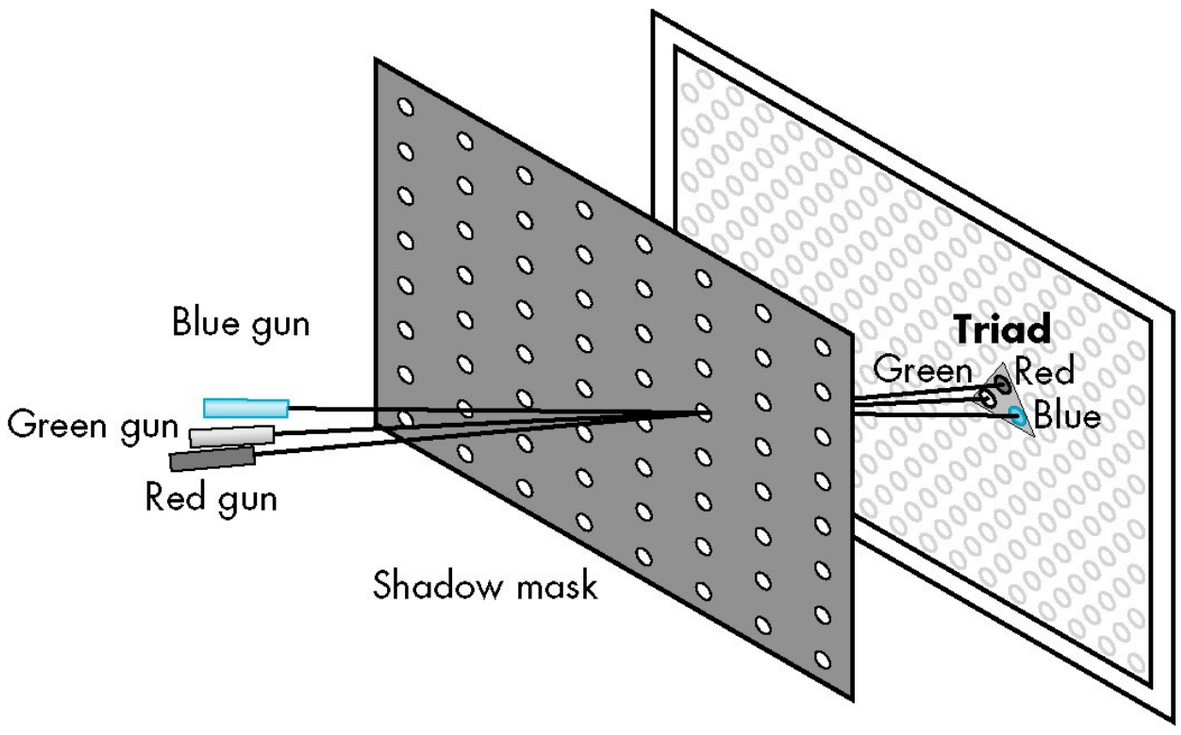


image from F. Hill "Computer Graphics Using OpenGL"





images from E. Angel and D. Shreiner "Interactive Computer Graphics"

LCD / LED displays

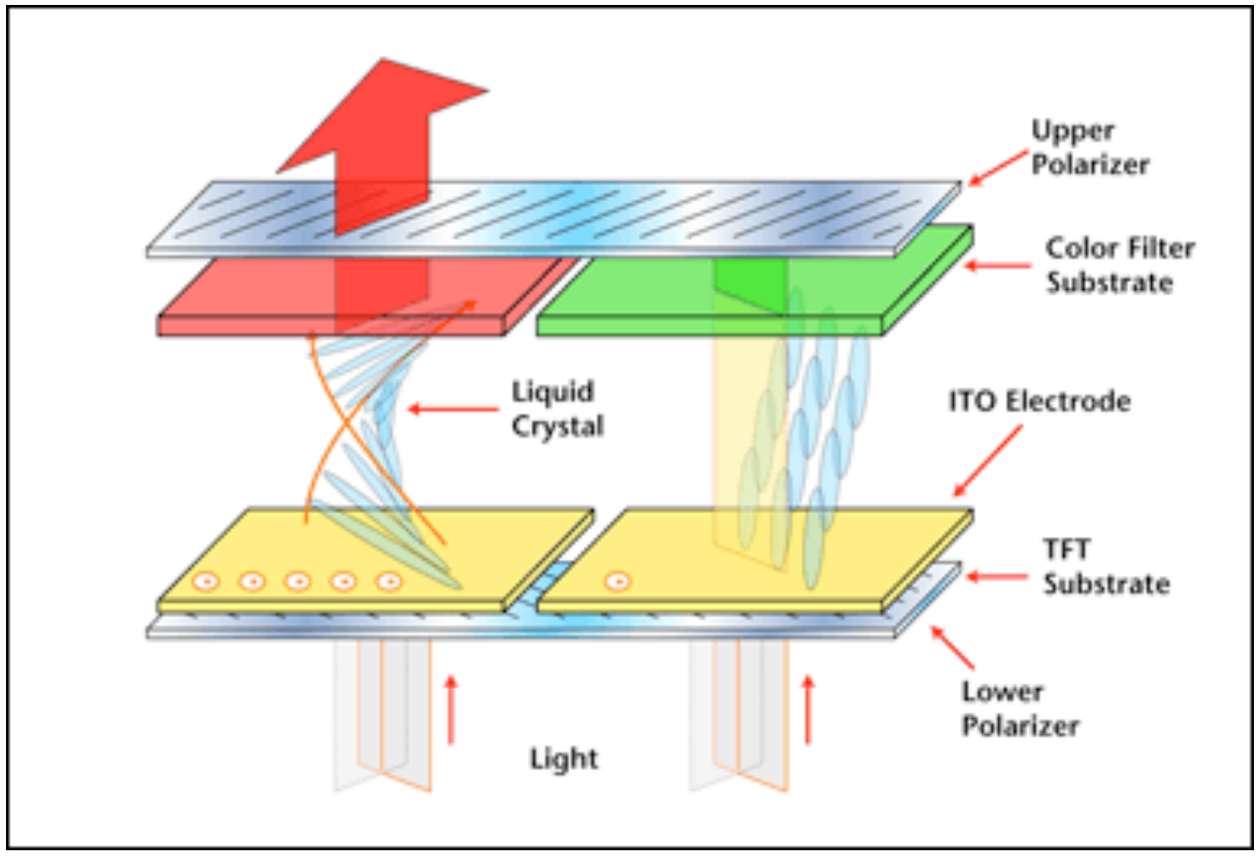


image from http://www.laptop-lcd-screen.co.uk/laptopparts/what-is-lcd-how-laptop-screen-works.asp

Plasma displays

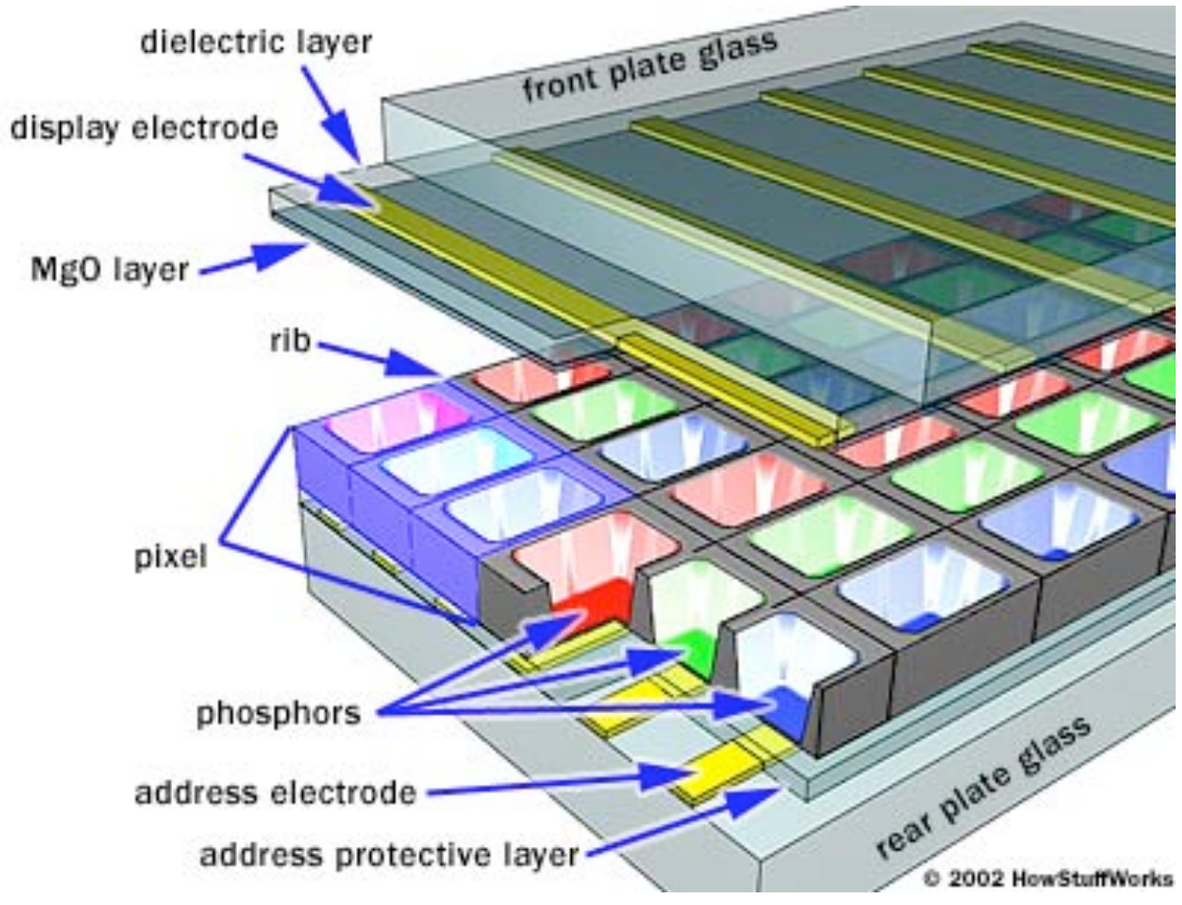
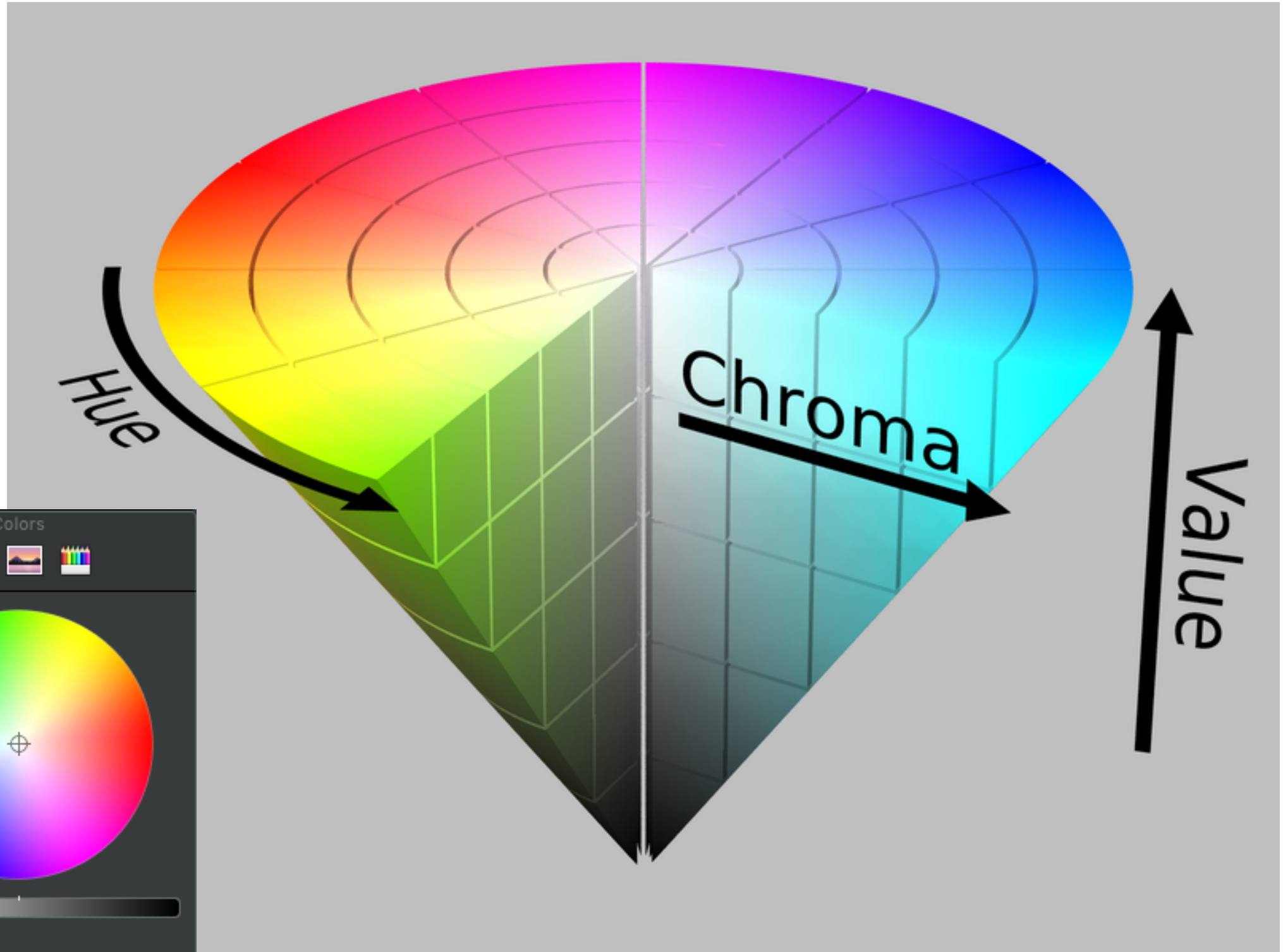
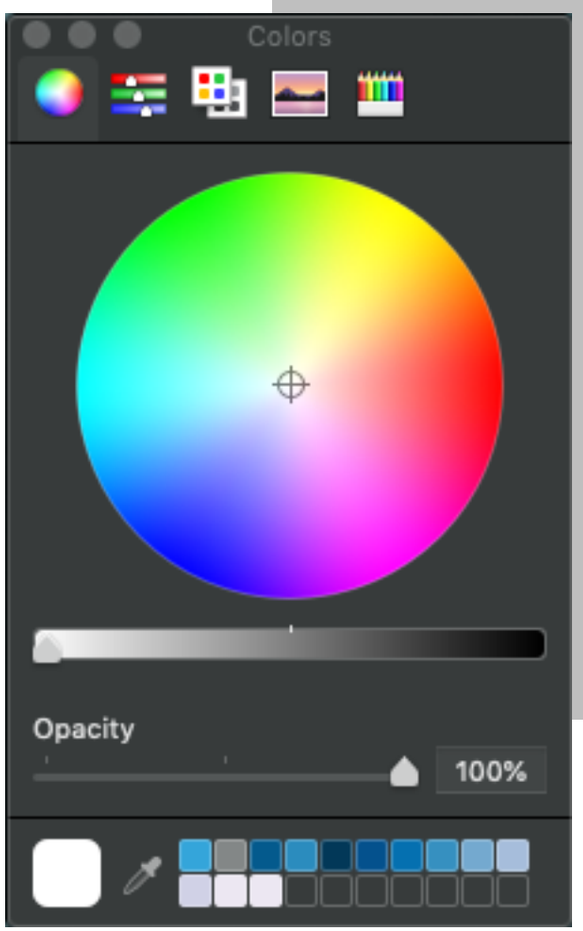


image from http://electronics.howstuffworks.com/plasma-display2.htm

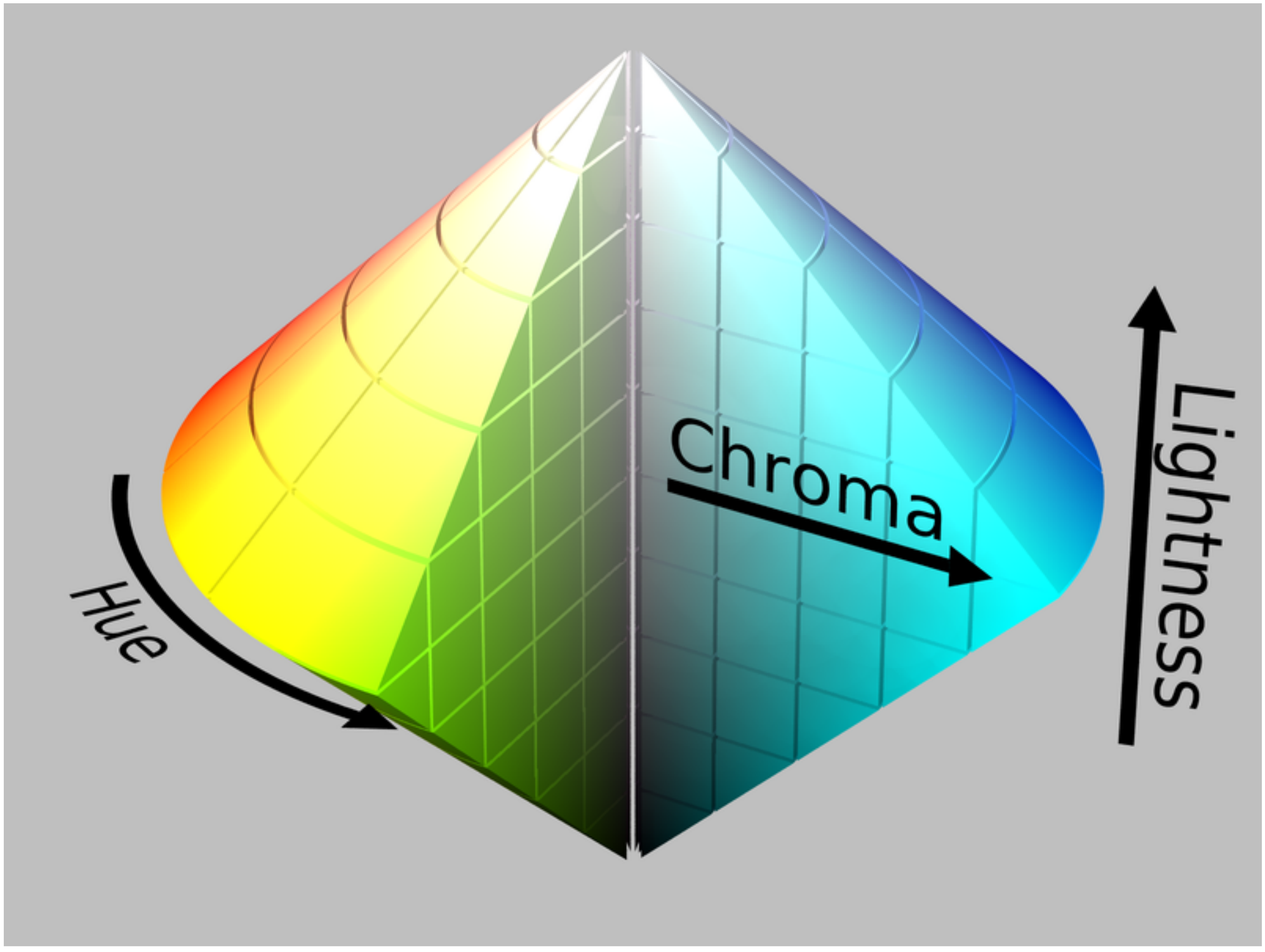
Hue Saturation Value [or Brightness] (HSV/HSB)



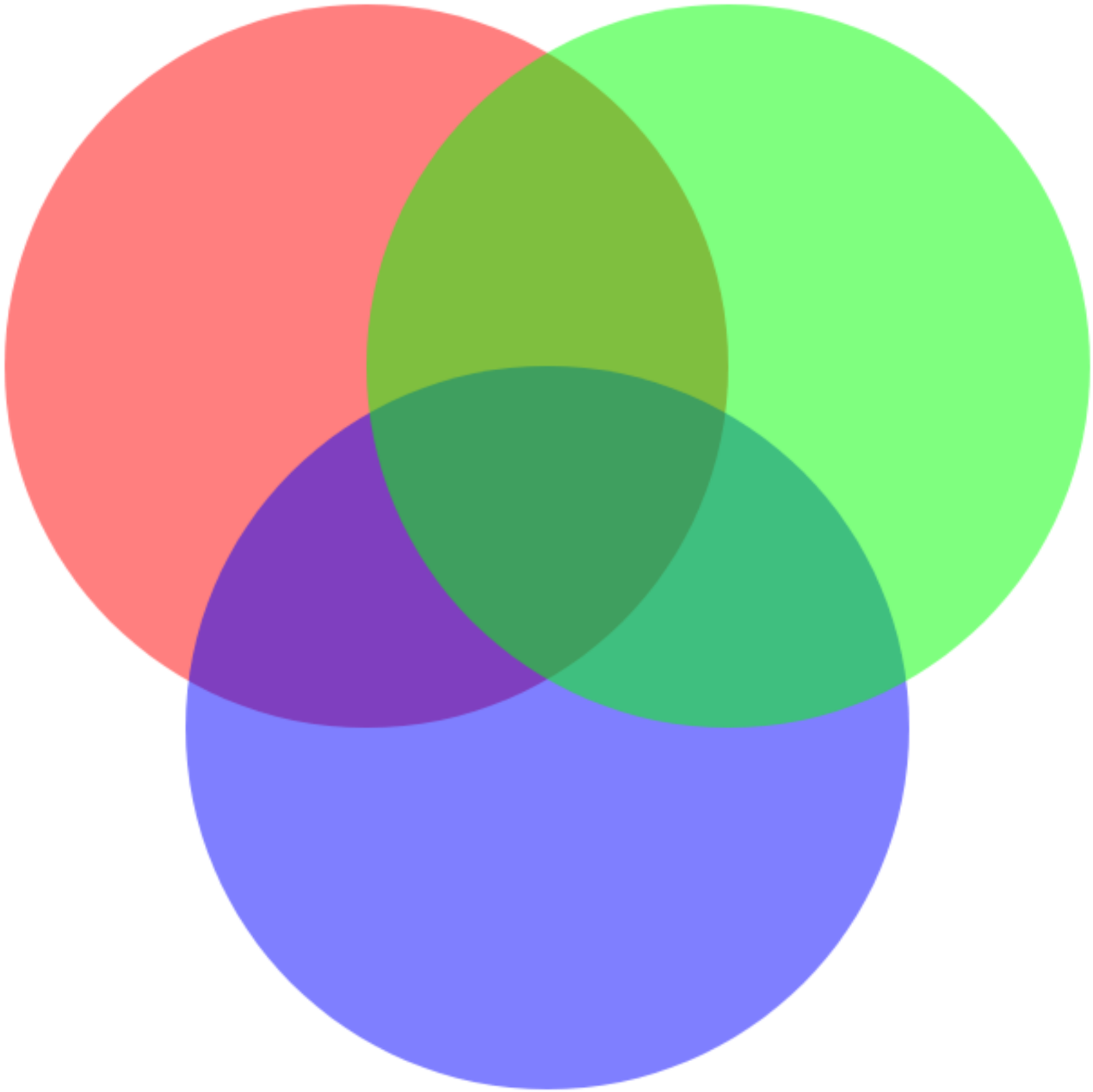


HSV Cone, Wikimedia Commons

Hue Saturation Lightness (HSL)



RGBA



Red

Green

Blue

Alpha

Blend modes

D - destination pixel

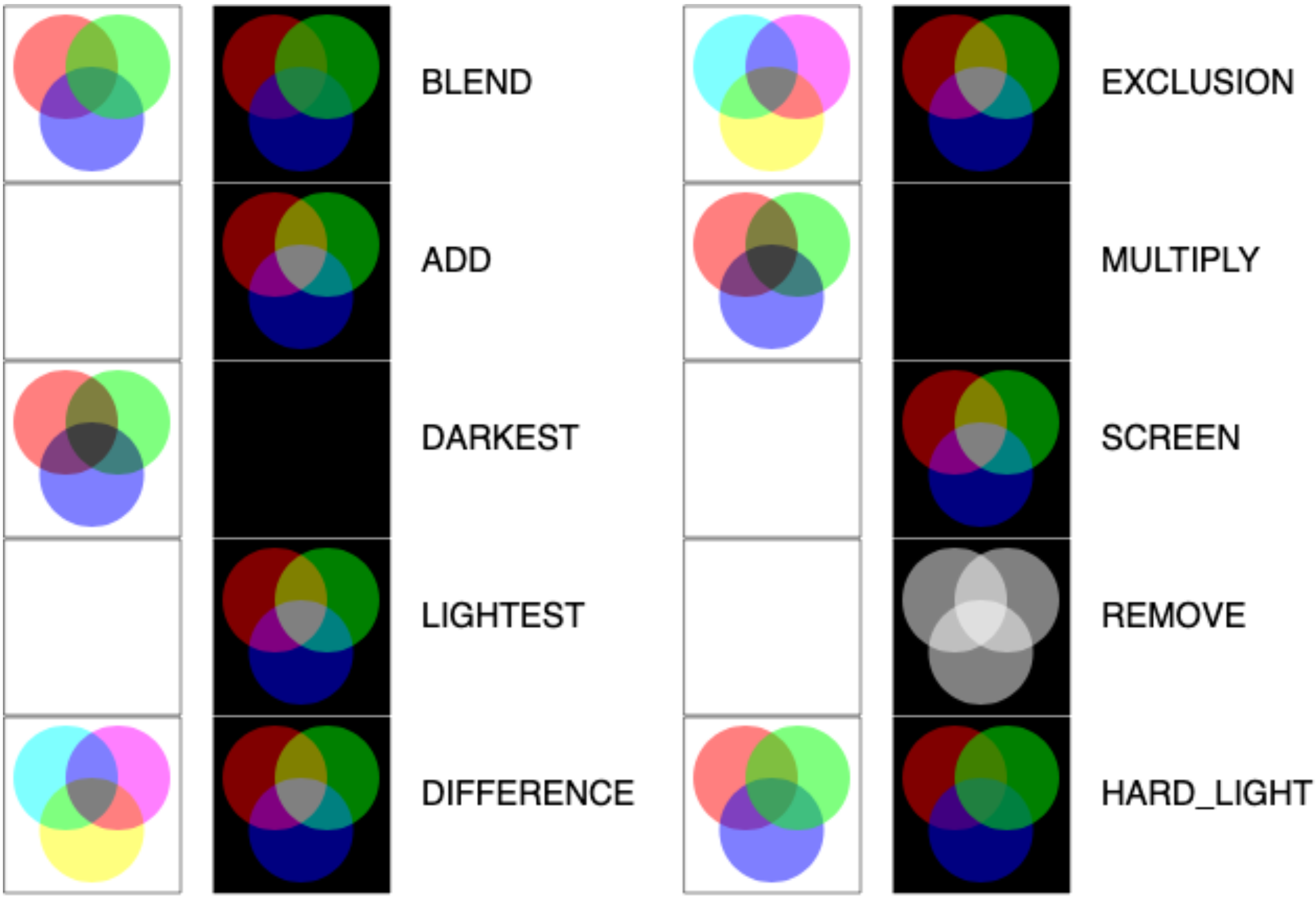
S - source pixel

Blend Mode	Behavior
BLEND	D’ = D * (1-alpha) + S * alpha
ADD	D’ = D + S * alpha
DARKEST	D’ = min(S * alpha, D)
LIGHTEST	D’ = max(S * alpha, D)
DIFFERENCE	D’ = max(D - S*alpha, S*alpha - D)
EXCLUSION	similar to DIFFERENCE but “less extreme”
MULTIPLY	D’ = D * S*alpha
SCREEN	D’ = 1 - ((1 - D) * (1 - S))
REPLACE	D’ = S
REMOVE	remove pixels from D with alpha strength of S
OVERLAY	Mix of MULTIPLY and SCREEN, multiplies dark values, screens light values
HARD_LIGHT	SCREEN when > 50% gray, MULTIPLY when lower
SOFT_LIGHT	Mix of DARKEST and LIGHTEST. Woks like OVERAY, but not as harsh
DODGE	D’ = D / (1 - (S * alpha)), lightens light tones, increases contrast, ignores darks
BURN	D’ = 1 - ((1-D) / (S*alpha)), darkens dark tones, increases contrast, ignores lights

https://p5js.org/reference/#/p5/blendMode

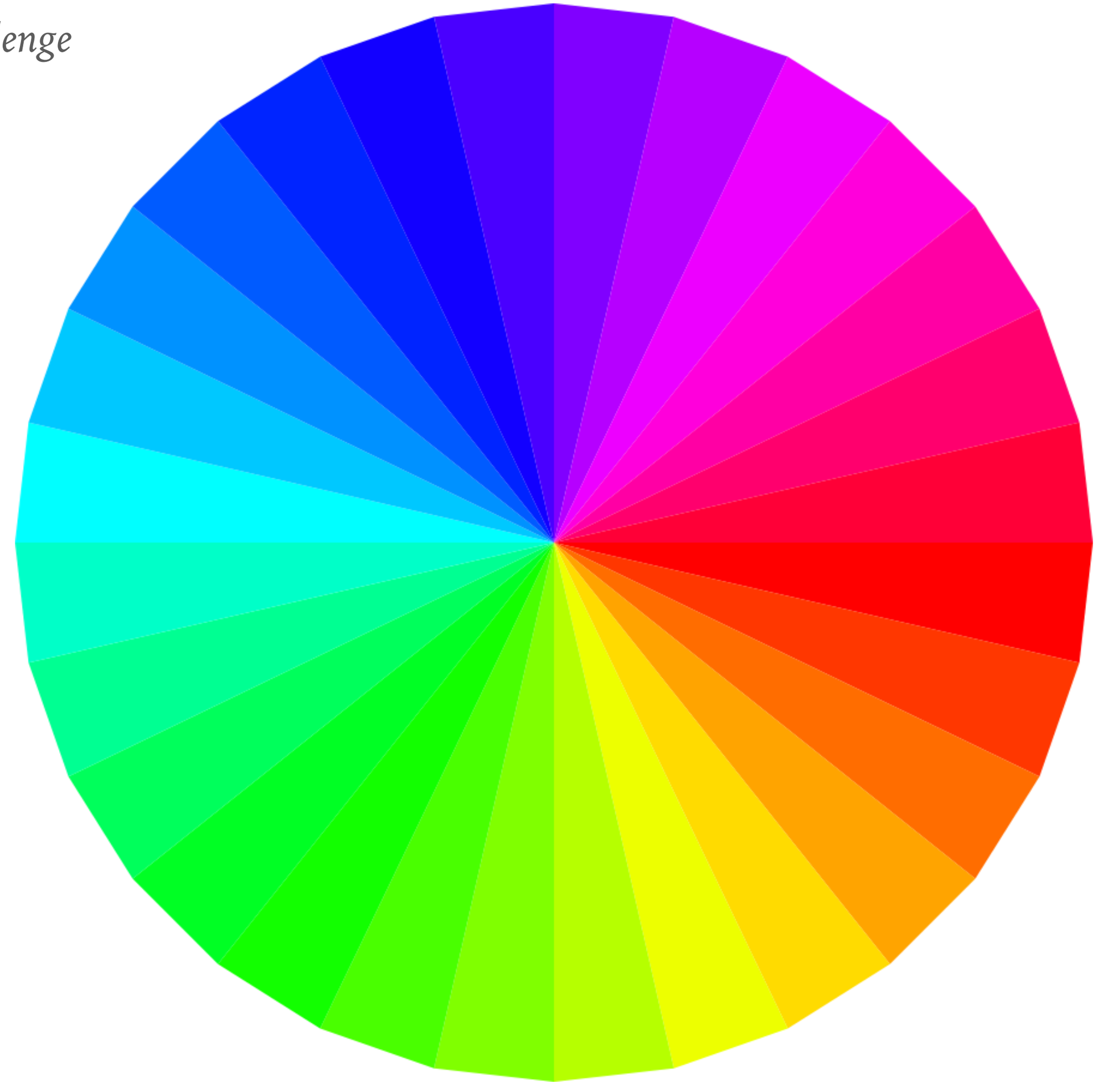
https://developer.mozilla.org/en-US/docs/Web/API/Canvas_API/Tutorial/Compositing

Blend modes



$alpha = 0.5$

aliceblue	#f0f8ff
antiquewhite	#faebd7
aqua	#00ffff
aquamarine	#7fffd4
azure	#f0ffff
beige	#f5f5dc
bisque	#ffe4c4
black	#000000
blanchedalmond	#ffebcd
blue	#0000ff
blueviolet	#8a2be2
brown	#a52a2a
burlywood	#deb887
cadetblue	#5f9ea0
chartreuse	#7fff00
chocolate	#d2691e
coral	#ff7f50
cornflowerblue	#6495ed
cornsilk	#fff8dc
crimson	#dc143c
cyan	#00ffff
darkblue	#00008b
darkcyan	#008b8b
darkgoldenrod	#b8860b
darkgray	#a9a9a9
darkgreen	#006400
darkgrey	#a9a9a9
darkkhaki	#bdb76b
darkmagenta	#8b008b
darkolivegreen	#556b2f
darkorange	#ff8c00
darkorchid	#9932cc
darkred	#8b0000
darksalmon	#e9967a
darkseagreen	#8fbc8f
darkslateblue	#483d8b
darkslategray	#2f4f4f
darkslategrey	#2f4f4f
darkturquoise	#00ced1
darkviolet	#9400d3
deeppink	#ff1493
deepskyblue	#00bfff
dimgray	#696969
dimgrey	#696969
dodgerblue	#1e90ff
firebrick	#b22222
floralwhite	#fffaf0
forestgreen	#228b22
fuchsia	#ff00ff
gainsboro	#dcdcdc
ghostwhite	#f8f8ff
gold	#ffd700
goldenrod	#daa520
gray	#808080
green	#008000
greenyellow	#adff2f
grey	#808080
honeydew	#f0fff0
hotpink	#ff69b4
indianred	#cd5c5c
indigo	#4b0082
ivory	#fffff0
khaki	#f0e68c
lavender	#e6e6fa
lavenderblush	#fff0f5
lawngreen	#7cfc00
lemonchiffon	#fffacd
lightblue	#add8e6
lightcoral	#f08080
lightcyan	#e0ffff
lightgoldenrodyell	#fafad2
lightgray	#d3d3d3
lightgreen	#90ee90
lightgrey	#d3d3d3
lightpink	#ffb6c1
lightsalmon	#ffa07a
lightseagreen	#20b2aa
lightskyblue	#87cefa
lightslategray	#778899
lightslategrey	#778899
lightsteelblue	#b0c4de
lightyellow	#ffffe0
lime	#00ff00
limegreen	#32cd32
linen	#faf0e6
magenta	#ff00ff
maroon	#800000
mediumaquamarin	#66cdaa
mediumblue	#0000cd
mediumorchid	#ba55d3
mediumpurple	#9370db
mediumseagreen	#3cb371
mediumslateblue	#7b68ee
mediumspringgree	#00fa9a
mediumturquoise	#48d1cc
mediumvioletred	#c71585
midnightblue	#191970
mintcream	#f5fffa
mistyrose	#ffe4e1
moccasin	#ffe4b5
navajowhite	#ffdead
navy	#000080
oldlace	#fdf5e6
olive	#808000
olivedrab	#6b8e23
orange	#ffa500
orangered	#ff4500
orchid	#da70d6
palegoldenrod	#eee8aa
palegreen	#98fb98
paleturquoise	#afeeee
palevioletred	#db7093
papayawhip	#ffefd5
peachpuff	#ffdab9
peru	#cd853f
pink	#ffc0cb
plum	#dda0dd
powderblue	#b0e0e6
purple	#800080
rebeccapurple	#663399
red	#ff0000
rosybrown	#bc8f8f
royalblue	#4169e1
saddlebrown	#8b4513
salmon	#fa8072
sandybrown	#f4a460
seagreen	#2e8b57
seashell	#fff5ee
sienna	#a0522d
silver	#c0c0c0
skyblue	#87ceeb
slateblue	#6a5acd
slategray	#708090
slategrey	#708090
snow	#fffafa
springgreen	#00ff7f
steelblue	#4682b4
tan	#d2b48c
teal	#008080
thistle	#d8bfd8
tomato	#ff6347
turquoise	#40e0d0
violet	#ee82ee
wheat	#f5deb3
white	#ffffff
whitesmoke	#f5f5f5
yellow	#ffff00
yellowgreen	#9acd32

https://drafts.csswg.org/css-color/

mini-challenge