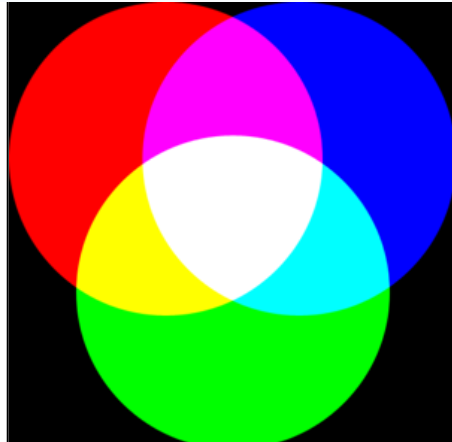


RGB Color Space

RGB is shorthand for **R**ed, **G**reen, **B**lue.



A Representation of additive color mixing.

The RGB color model is an additive model in which red, green and blue (often used in additive light models) are combined in various ways to reproduce other colors. The name of the model and the abbreviation "RGB" come from the three primary colors, Red, Green and Blue. These three colors should not be confused with the primary pigments of red, blue and yellow, known in the art world as "primary colors".

RGB is a convenient color model for computer graphics because the human visual system works in a way that is similar - though not quite identical - to an RGB color space. The most commonly used RGB color spaces are sRGB and Adobe RGB, which has a significantly larger gamut than sRGB. Adobe has recently developed another color space called Adobe Wide Gamut RGB, which is even larger, in detriment of gamut density.

As of 2004, sRGB is by far the most commonly used RGB color space, particularly in consumer grade digital cameras, because it is considered adequate for most consumer applications, and its design simplifies previewing on the typical computer display. Adobe RGB is being built into more medium-range digital cameras, and is favored by many professional graphic artists for its larger gamut.

RGB spaces are generally specified by defining three primary colors and a white point. In the table below the three primary colors and white points for various RGB spaces are given. The primary colors are specified in terms of their CIE_1931_color_space chromaticity coordinates (x,y).

Some RGB color space parameters (from Susstrunk, Buckley and Swen 2005)

Color Space	Gamut	White Point	Primaries					
			X _R	Y _R	X _G	Y _G	X _B	Y _B
ISO RGB	Limited	floating	floating					
Extended ISO RGB	Unlimited (signed)	floating	floating					
sRGB, HDTV (ITU-R BT.709-3)	CRT	D65	0.6 4	0.33	0.30	0.60	0.15	0.06
ROMM RGB	Wide	D50	0.7 347	0.2653	0.1596	0.8404	0.0366	0.0001
Adobe RGB 98	CRT	D65	0.6 4	0.34	0.21	0.71	0.15	0.06
Apple RGB	CRT	D65	0.6 25	0.34	0.28	0.595	0.155	0.07
NTSC (FCC 1953)	CRT	Ill. C	0.6 7	0.33	0.21	0.71	0.14	0.08
NTSC (1979) (SMPTE C , SMPTE-RP 145)	CRT	D65	0.6 3	0.34	0.31	0.595	0.155	0.07
PAL/SECAM (EBU 3213, ITU-R BT.470-6)	CRT	D65	0.6 4	0.33	0.29	0.60	0.15	0.06
CIE (1931)	Wide	E	0.7 347	0.2653	0.2738	0.7174	0.1666	0.0089

Note that CIE 1931 (or CIE XYZ) is not an RGB color space

HSV color space

The **HSV** (Hue, Saturation, Value) model, also known as **HSB** (Hue, Saturation, Brightness), defines a color space in terms of three constituent components:

- Hue, the color type (such as red, blue, or yellow):
 - Ranges from 0-360 (but normalized to 0-100% in some applications)
- Saturation, the "vibrancy" of the color:
 - Ranges from 0-100%
 - Also sometimes called the "purity" by analogy to the colorimetric quantities [excitation purity](#) and [colorimetric purity](#)
 - The lower the saturation of a color, the more "grayness" is present and the more faded the color will appear, thus useful to define *desaturation* as the qualitative inverse of saturation
- Value, the brightness of the color:
 - Ranges from 0-100%

The HSV model was created in 1978 by Alvy Ray Smith. It is a nonlinear transformation of the [RGB color space](#), and may be used in color progressions. Note that HSV and HSB are the same, but HSL is different.

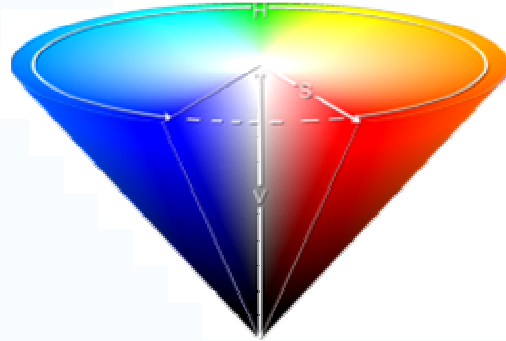
Visualization of HSV



An HSV color wheel allows the user to quickly select a multitude of colors.

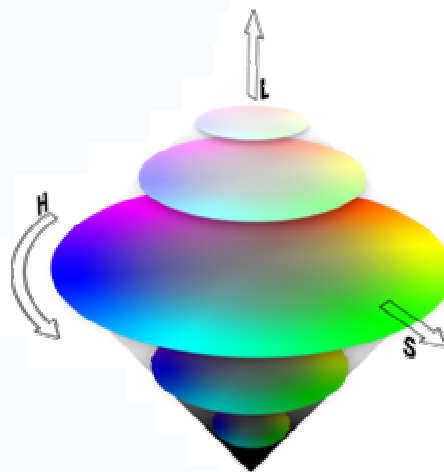
The HSV model is commonly used in computer graphics applications. In various application contexts, a user must choose a color to be applied to a particular graphical element. When used in this way, the HSV color wheel is often used. In it, the hue is represented by a circular region; a separate triangular region may be used

to represent saturation and value. Typically, the vertical axis of the triangle indicates saturation, while the horizontal axis corresponds to value. In this way, a color can be chosen by first picking the hue from the circular region, then selecting the desired saturation and value from the triangular region.



The conical representation of the HSV model is well-suited to visualizing the entire HSV color space in a single object.

HSL color space



The HSL color space, also called HLS or HSI, stands for Hue, Saturation, Lightness (also Luminance or Luminosity) / Intensity. While HSV (Hue, Saturation, Value) can be viewed graphically as a color cone or hexcone, HSL is drawn as a double cone or double hexcone. Both systems are non-linear deformations of the RGB colour cube. The two apices of the HSL double hexcone correspond to black and white. The angular parameter corresponds to hue, distance from the axis corresponds to saturation, and distance along the black-white axis corresponds to lightness.