

⚡️ 🌈 Colours in CSS 🌈 ⚡️

I lub CSS. And I lub colours.
And you all dun wanna speak at Talk.CSS.
You tell me how???

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CSS colour of the month tracker #1

Edit New Issue

Open huijing opened this issue on Aug 30, 2017 · 0 comments

- huijing commented on Aug 30, 2017 · edited · Member
- maroon #800000 ● rgba(128,0,0,1) ●
 - darkred #8B0000 ● rgba(139,0,0,1) ●
 - brown #A52A2A ● rgba(165,42,42,1) ●
 - firebrick #B22222 ● rgba(178,34,34,1) ● (at Talk.CSS 17, May 31 2017)
 - rosybrown #BC8F8F ● rgba(188,143,143,1) ●
 - indianred #CD5C5C ● rgba(205,92,92,1) ●
 - lightcoral #F08080 ● rgba(240,128,128,1) ● (at Talk.CSS 51, Jun 3 2020)
 - red #FF0000 ● rgba(255,0,0,1) ●
 - snow #FFFAFA ● rgba(255,250,250,1) ● (at Talk.CSS 42, Aug 7, 2019)
 - mistyrose #FFE4E1 ● rgba(255,228,225,1) ●
 - salmon #FA8072 ● rgba(250,128,114,1) ●
 - tomato #FF6347 ● rgba(255,99,71,1) ● (at Talk.CSS 22, Oct 26 2017)
 - darksalmon #E9967A ● rgba(233,150,122,1) ●
 - coral #FF7F50 ● rgba(255,127,80,1) ● (at Talk.CSS 37, Mar 27 2019)
 - orangered #FF4500 ● rgba(255,69,0,1) ● (at Talk.CSS 35, Jan 30 2019)
 - lightsalmon #FFA07A ● rgba(255,160,122,1) ●
 - sienna #A0522D ● rgba(160,82,45,1) ● (at Talk.CSS 48, Mar 4 2020)
 - seashell #FFF5EE ● rgba(255,245,238,1) ●
 - saddlebrown #8B4513 ● rgba(139,69,19,1) ●
 - chocolate #D2691E ● rgba(210,105,30,1) ● (at Talk.CSS 18, Jun 28 2017)
 - sandybrown #F4A460 ● rgba(244,164,96,1) ●
 - peachpuff #FFDAB9 ● rgba(255,218,185,1) ●
 - peru #CD853F ● rgba(205,133,63,1) ● (at Talk.CSS 31, Aug 29 2018)
 - linen #FAF0E6 ● rgba(250,240,230,1) ●
 - bisque #FFE4C4 ● rgba(255,228,196,1) ●
 - darkorange #FF8C00 ● rgba(255,140,0,1) ● (at Talk.CSS 33, Oct 31 2018)

Assignees

No one—assign yourself

Labels

None yet

Projects

None yet

Milestone

No milestone

Linked pull requests

Successfully merging a pull request may close this issue.

None yet

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1 participant

<https://github.com/SingaporeCSS/talk.css/issues/1>

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I wrote a thing last year.

Where did CSS named colours come from?



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You should read this thing to hear from a professional.

Ask an expert: Why is CSS...the way it is?



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Whiteness and all grey Colours between white and black, may be compounded of Colours, and the whiteness of the Sun's Light is compounded of all the primary Colours mix'd in a due Proportion.

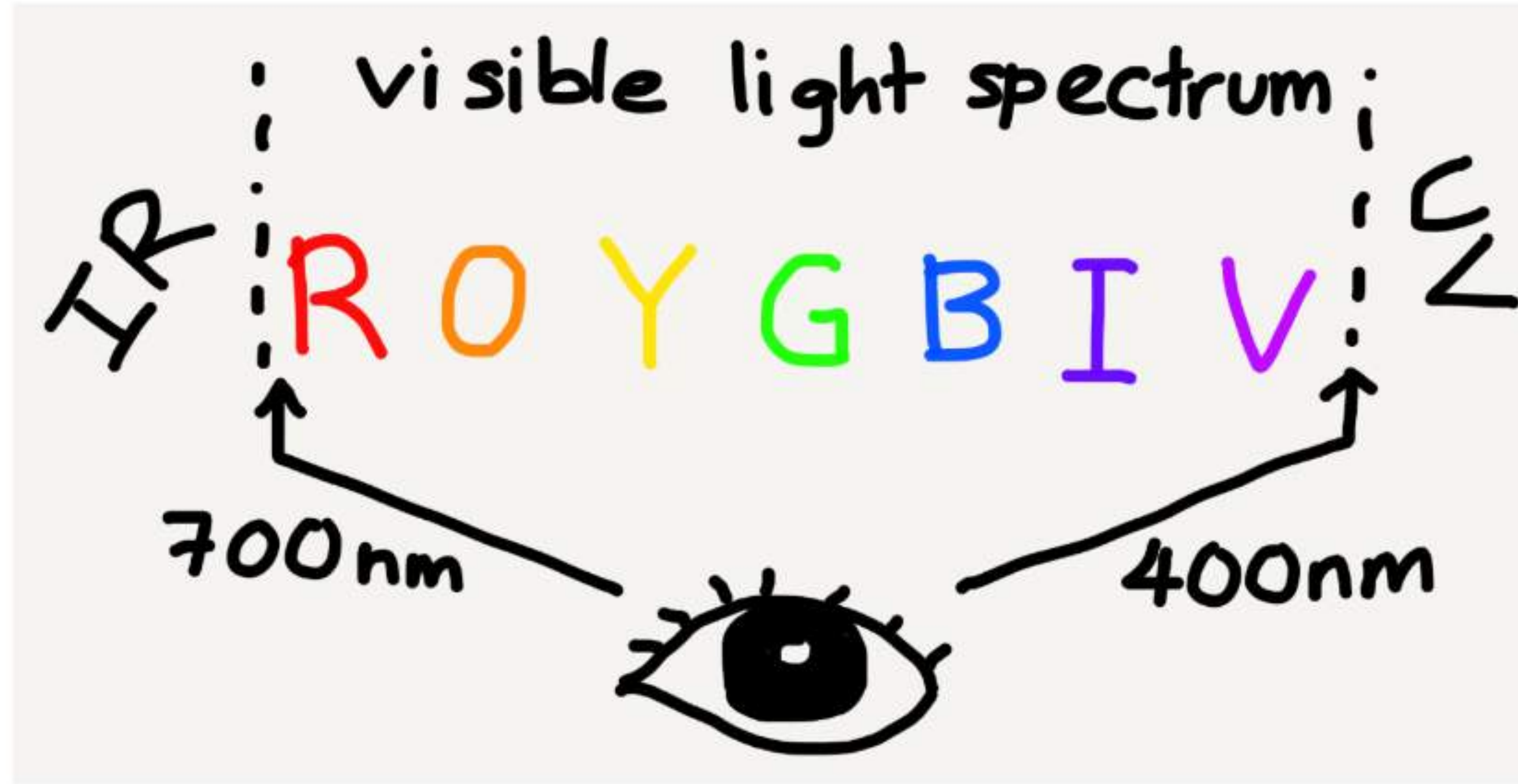
-Sir Issac Newton, Opticks (Prop. V Theor. IV.)



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Colour



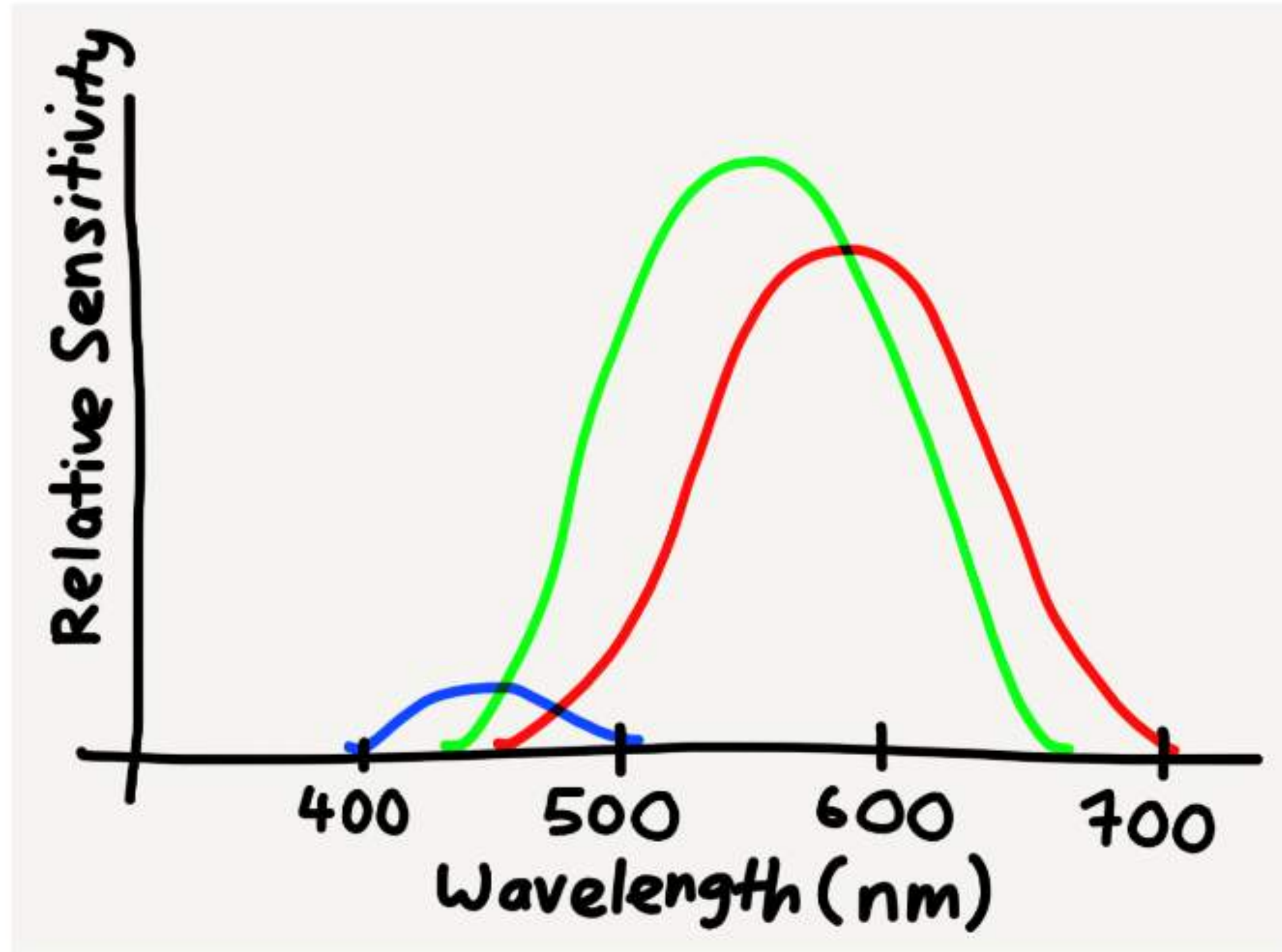
Perceived according to the **wavelength** of the **light** which strikes the eye



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Trichromat spectral sensitivity



General diagram, individual profiles will vary



Colour space

The resultant set of colours when a colour model is associated with a precise description of how components are to be interpreted

Concept seems to have been developed by Hermann Grassmann

Grassmann published his theory of how colours mix in 1853

Colour can be represented as a convex cone in the 3D linear space



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Colour Gamut

The portion of the colour space that can be represented or reproduced

Generally specified on the hue-saturation plane

When a colour **cannot** be expressed within a particular colour model, it is
out of gamut

English translation of *Theorie der Pigmente von grösster Leuchtkraft* by
Erwin Schrödinger

As of now, a device that can reproduce the entire visible colour space
remains an unrealised goal within the engineering of colour displays and
printing processes



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Chromaticity

An objective specification of the quality of a colour regardless of its luminance

Consists of two independent parameters, often specified as hue (h) and colourfulness (s)

Allows for representation via polar coordinates with respect to a white point of a display



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Light is either



emitted

or

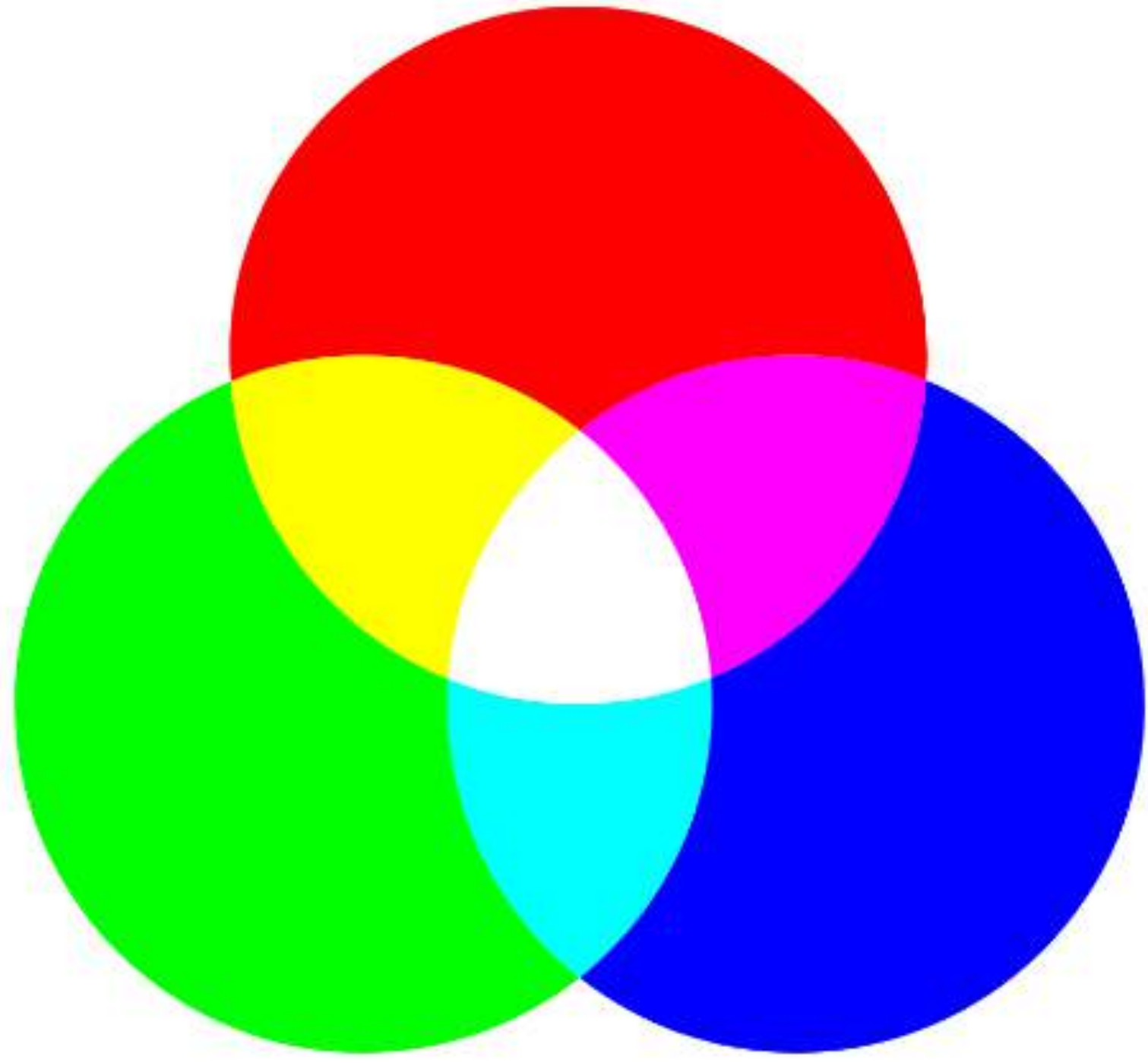


reflected

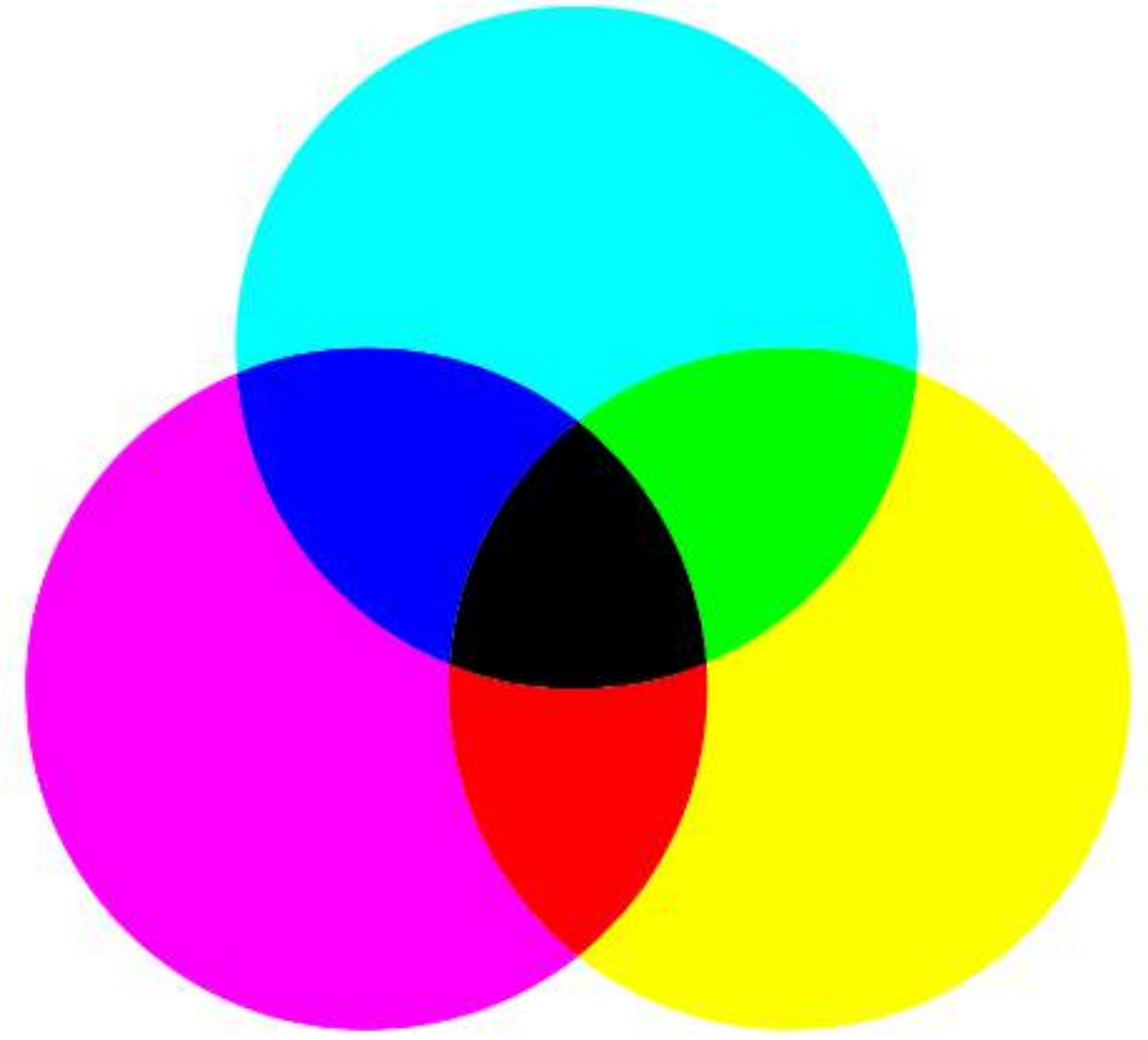


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Additive



Subtractive



CMYK colour model

For colour creation in **printing** and **film**

Uses the subtractive primary colours of pigment (**Cyan**, **Magenta**, **Yellow**, Key (black))

Magenta on the X-axis, **Cyan** on the Y-axis, **Yellow** on the Z-axis

Starts with white, and variable amounts of dye subtracts some colours from light leaving others, **cyan** absorbs **red**, **magenta** absorbs **green**, **yellow** absorbs **blue**



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RGB colour model

All light-emitting displays would use an additive colour model

RGB is device-dependent, thus an RGB value will not define the same colour across devices without some kind of colour management

A colour is expressed by indicating how much of each of the red, green, and blue is included in numerical terms

For computers, component values are stored as integer values ranging from 0 to 255, which is the range an 8-bit byte can offer



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Colours in CSS1

5.3 Color and background properties

`color` to describe the text colour of an element

`background-color` to describe the background colour of an element

Colour can either be a keyword or a numerical RGB specification

Hex codes are simply RGB colours in the hexadecimal notation



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#4235e

0	1	2	3
4	5	6	7
8	9	A	B
C	D	E	F

0 → 255

00 → FF
(15 × 16 + 15)



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David DeSandro, dotCSS 2018

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transparent

Was there from the beginning and is the initial value of `background-color`

CSS2 allowed its use in `border-color`

CSS3 allowed its use in all elements that accepted a colour value

Computes to `rgba(0, 0, 0, 0)`



The sRGB colour space

sRGB (standard Red Green Blue) is an RGB color space created by HP and Microsoft for monitors, printers and the Web

Original document: [A Standard Default Color Space for the Internet - sRGB](#)

Colours in CSS were first specified in RGB

Even though there were better systems, RGB was “good enough” at the time



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Colour Naming System (CNS)

A systematic notation for named colours for computer applications using English terms created by Berk, Brownston and Kaufman in 1982

Uses ten colour names: red, orange, brown, yellow, green, blue, purple, white, grey and black

Base colour names can be combined or prefixed with modifiers

5 lightness terms, 4 saturation terms and 31 hue terms combine to produce 620 chromatic colour names

Not meant for computation, rather, a mechanism for naming colour literals and constants



CNS expressed in Backus-Naur form

```
named-color    := gray-color | chromatic-color

gray-color     := 'black' | 'white' | lightness gray
gray           := 'gray' | 'grey'

chromatic-color := [ tint | shade ] hue | [ lightness | saturation ]? hue
tint           := 'whitish' | 'pale' | 'brilliant' | 'vivid'
shade          := 'blackish' | 'dim' | 'deep' | 'vivid'
saturation     := 'grayish' | 'moderate' | 'strong' | 'vivid'
lightness      := 'moderate' | 'very'? [ 'dark' | 'light' ]
hue            := splash-color? base-color | base-color '-' base-color
base-color     := 'red' | 'orange' | 'brown' | 'yellow' | 'green' | 'blue' | 'purple'
splash-color   := 'reddish' | 'orangish' | 'brownish' | 'yellowish' | 'greenish' | 'bluish' | 'purplish'
```

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Named colours

Based on the X11 colours

Supported in Mosaic and Netscape Navigator because both ran in X
Windows System

Chris Lilley lost the fight to use names from the Colour Naming System (CNS)

The path of least resistance was chosen _(ツ)_/

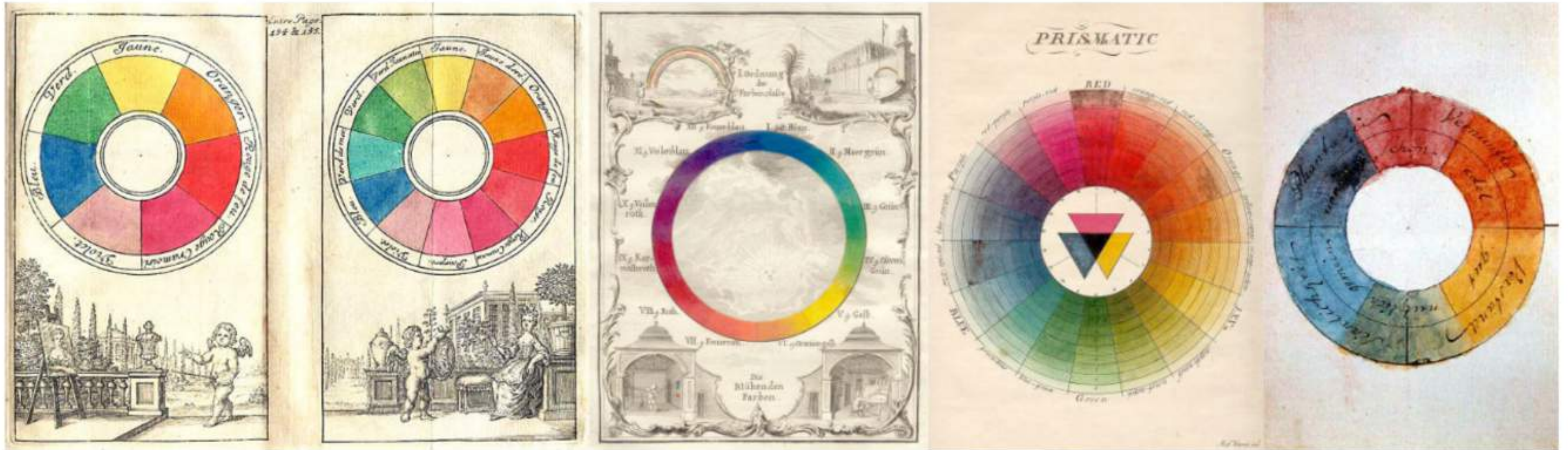


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Colour wheels

An abstract illustrative organisation of colour hues around a circle to show the relationships between them



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When the eye sees a colour it is immediately excited and it is its nature, spontaneously and of necessity, at once to produce another, which with the original colour, comprehends the whole chromatic scale.

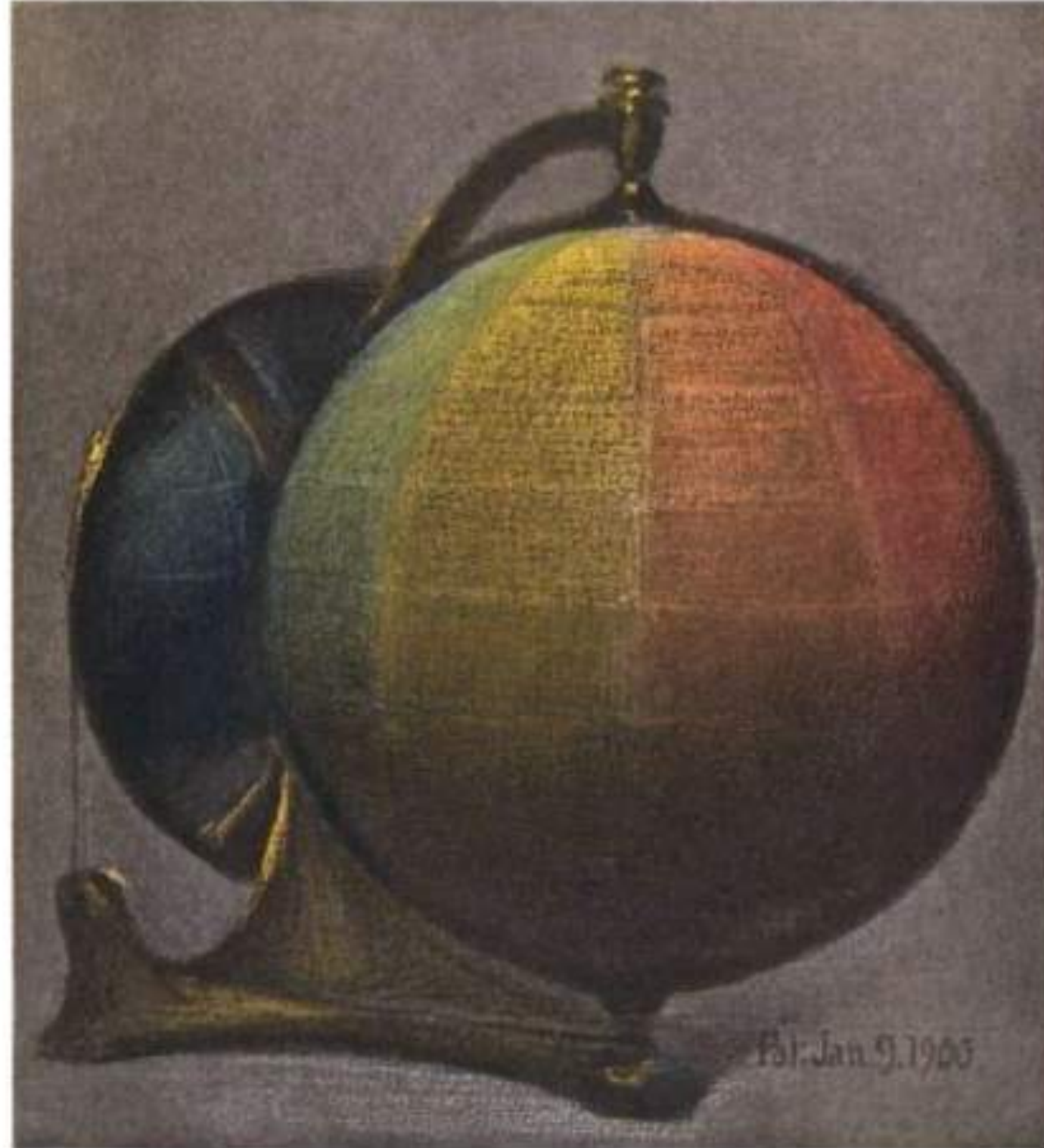
Johann Wolfgang von Goethe, Theory of Colours, Part VI, Completeness and Harmony



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Munsell colour system



Created by Professor Albert H. Munsell

A colour space that specifies colours based on three properties of colour: hue, chroma and value

The first system which separated hue, value and chroma into perceptually uniform and independent dimensions

Munsell was the first person to illustrate colours systematically in three-dimensional space

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CIELAB colour space

Defined by the *International Commission on Illumination* (CIE) in 1976

Also known as LAB, for lightness, green/red and blue/yellow respectively

CIELAB gamut includes both the gamuts for RGB and CMYK

Meant to approximate human vision and aspires to perceptual uniformity

Needed more data per pixel to obtain the same precision as RGB or CMYK



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HSL colours

An alternative representation of the RGB colour model, utilising a cylindrical geometry, **hue** being the angular dimension, **saturation** along the radial direction and **lightness** from top to bottom

Based on the organisation and conceptualisation of colours in human vision

Conversion from RGB was fast enough to run in real time on 1970s hardware

HSL was added to CSS in 2002 from the desire to have some sort of hue wheel system

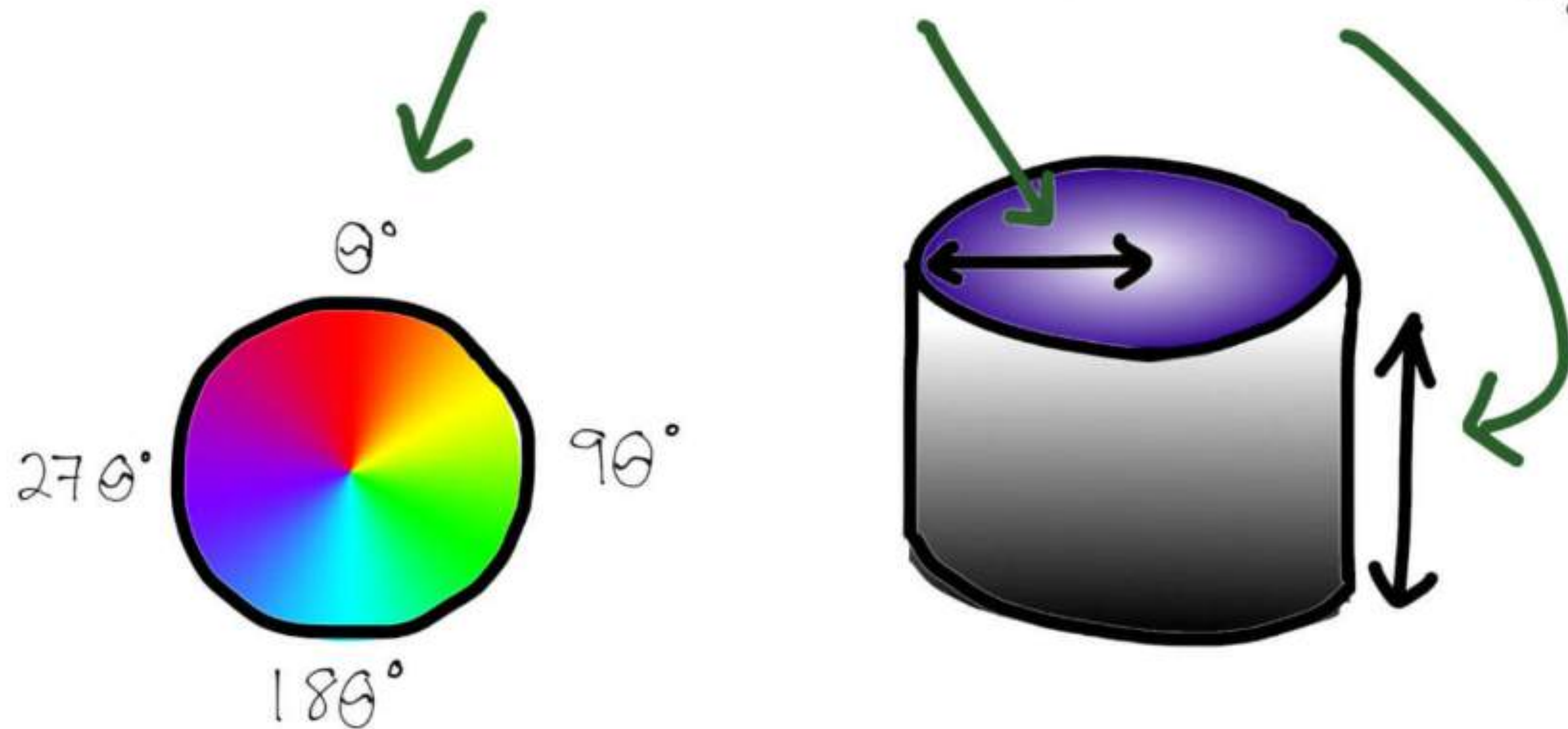
Fast forward to today, its disadvantages (non-perceptual uniformity being a key one) are flaring their head



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`hsl(259, 27.9%, 28.8%)`



Hue is unitless as degrees is implicit, *Saturation* and *Lightness* are in percentages

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Moar colour formats

CSS Color Module Level 4

HWB colours (hue, whiteness, blackness)

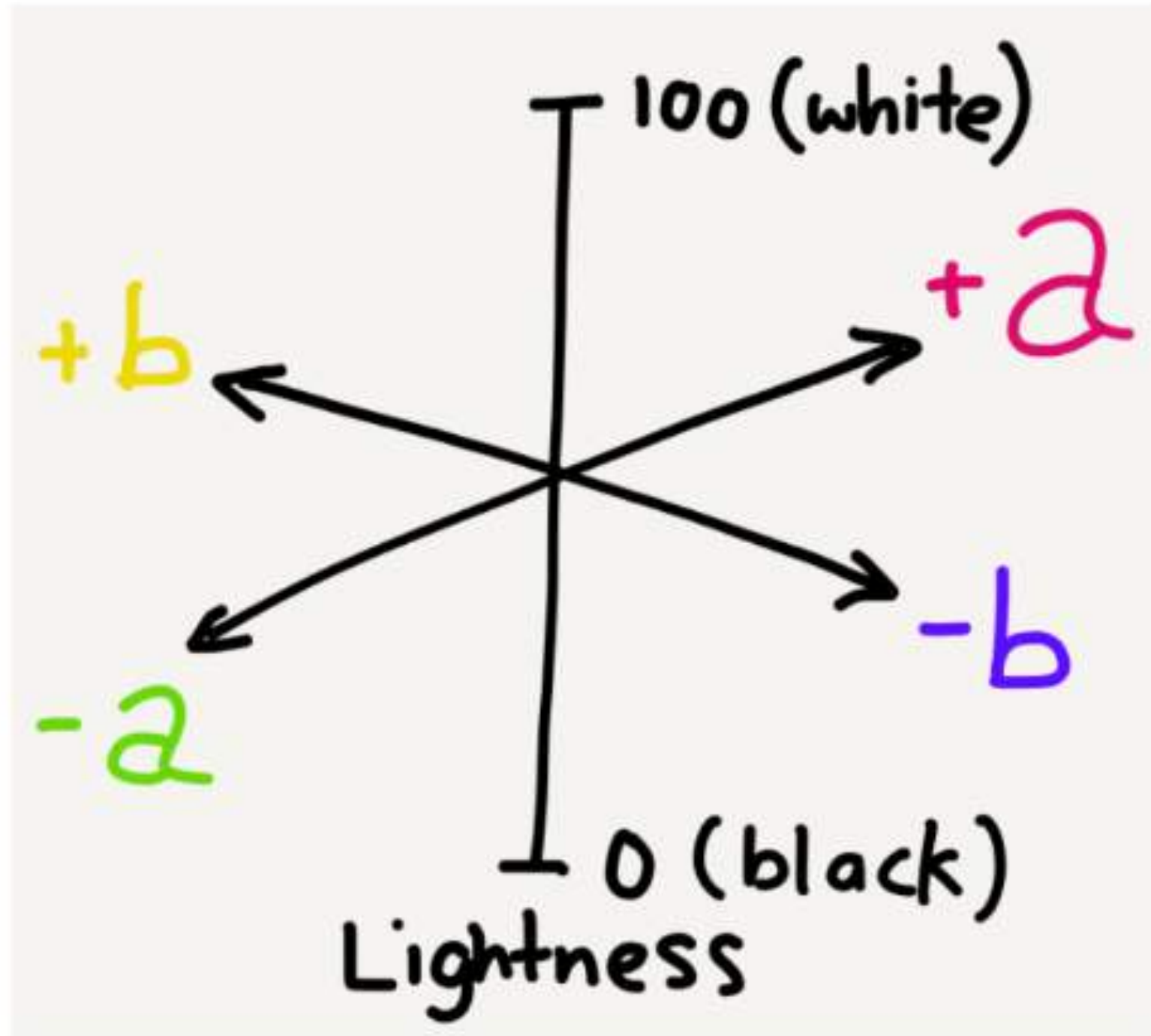
Lab colours (lightness, green/red (a-axis), blue/yellow (b-axis))

LCH colours (lightness, chroma, hue)

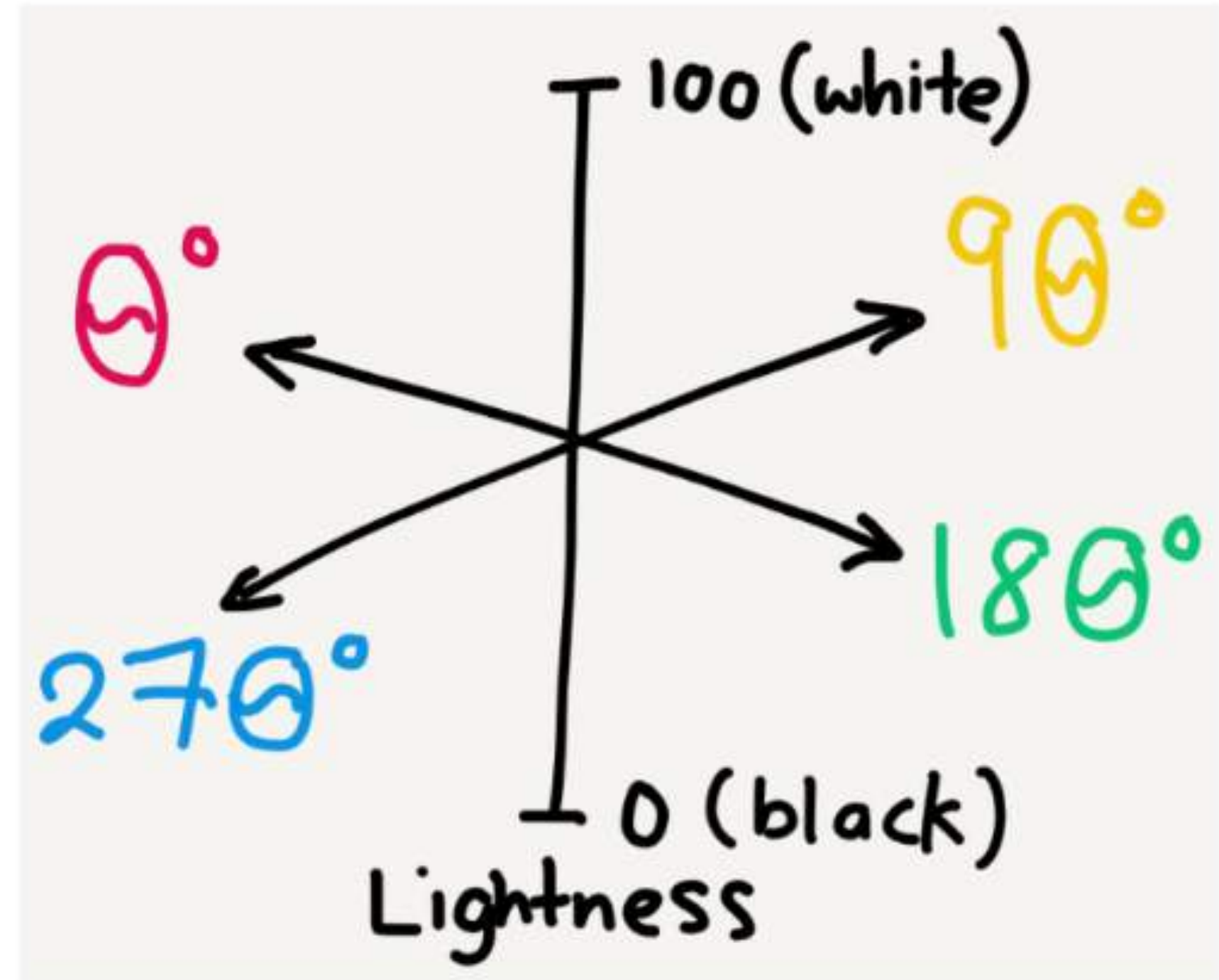
`gray()` function



Badly-drawn visualisations



Lab axes



L and hue



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Moar colour functions

CSS Color Module Level 5

`color-mix()`

```
mix-color(peru lightgoldenrod 40%)
```

`color-contrast()`

```
color-contrast(purple, chartreuse, firebrick, ghostwhite)  
/* ghostwhite wins with a ratio of 8.9 */
```

`color-adjust()`

```
color-adjust(darkslategrey lightness(-20%));
```

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Bunch of resources on colour...

- Complete Text of Opticks
- Experiments show hummingbirds see colors you've never dreamed of
- Ask an expert: Why is CSS...the way it is?
- "Tomato" versus "#FF6347"—the tragicomic history of CSS color names
- Where did CSS named colours come from?
- What is the color of a blank page?
- Complete Text of Goethe's Theory of Colours
- The CNS Color Naming System



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 **kthxbye** 

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