CIE Chromosity Diagram

30 → 20 color space

$$x + y + z = 1$$

$$x = \frac{X}{X+Y+Z}$$

$$z = 1 - x - y$$

$$y = \frac{Y}{X+Y+Z}$$

weights

Color Models

✱ RGB
color monitors
cameras

Emitted light

✱ CMYK
(cyan magenta
yellow black)
printers
Reflected light

✱ HSI
(Hue, saturation,
illuminance)
for human

RGB Color model

Based on a cartesian system
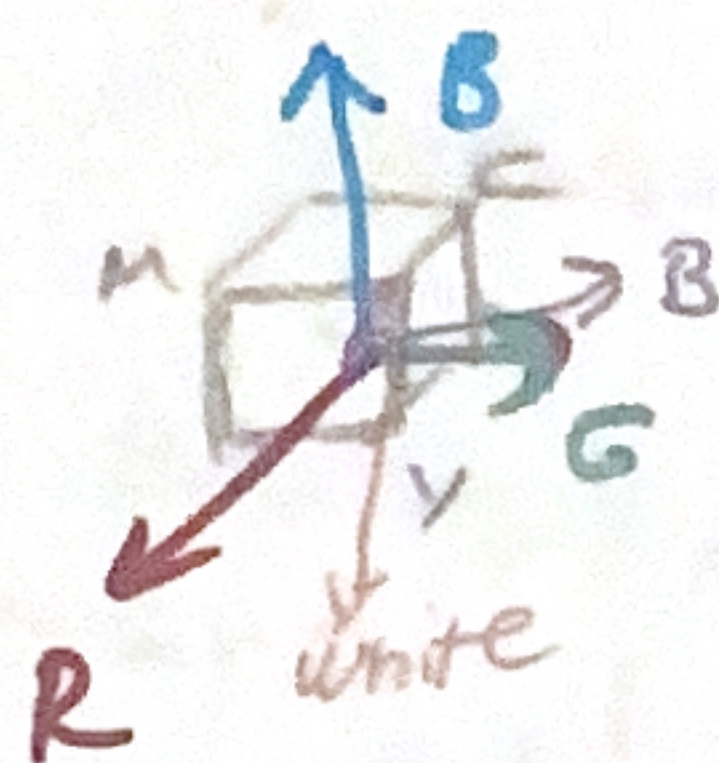
R: 0-255 1byte
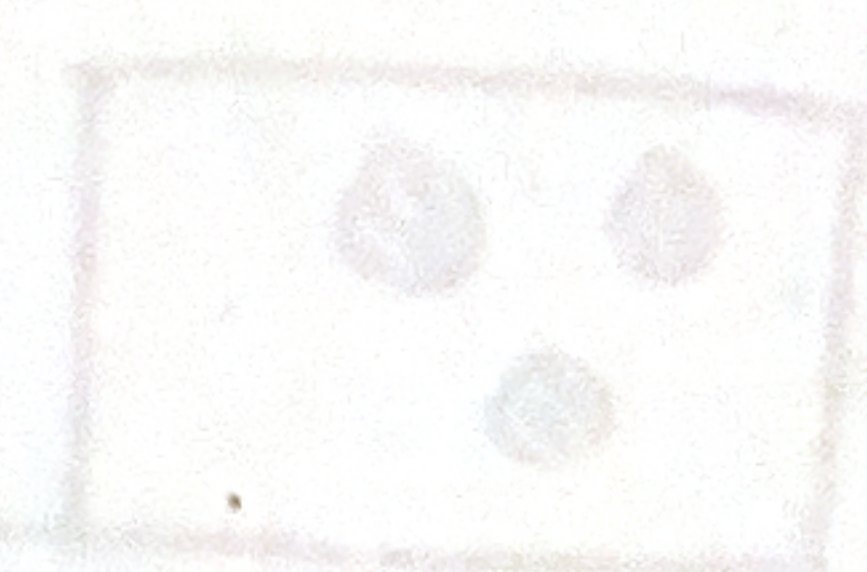G: 0-255 1byte
B: 0-255 1byte

Emitted light

ex

```
>> I = zeros(100,100,3)
>> I(:,:,1)=255 → only red image
>> I(:,:,2)=255 → made it yellow
>> I(:,:,3)=255 → made it white
```

the color layer itself
is white

CMYK Color Model

Expresses reflected light

$$\begin{bmatrix} C \\ M \\ Y \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} - \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$

if $\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$ then $\begin{bmatrix} C \\ M \\ Y \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

k = Black

(black)

black

if $\begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$ then $\begin{bmatrix} C \\ M \\ Y \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$

white   white