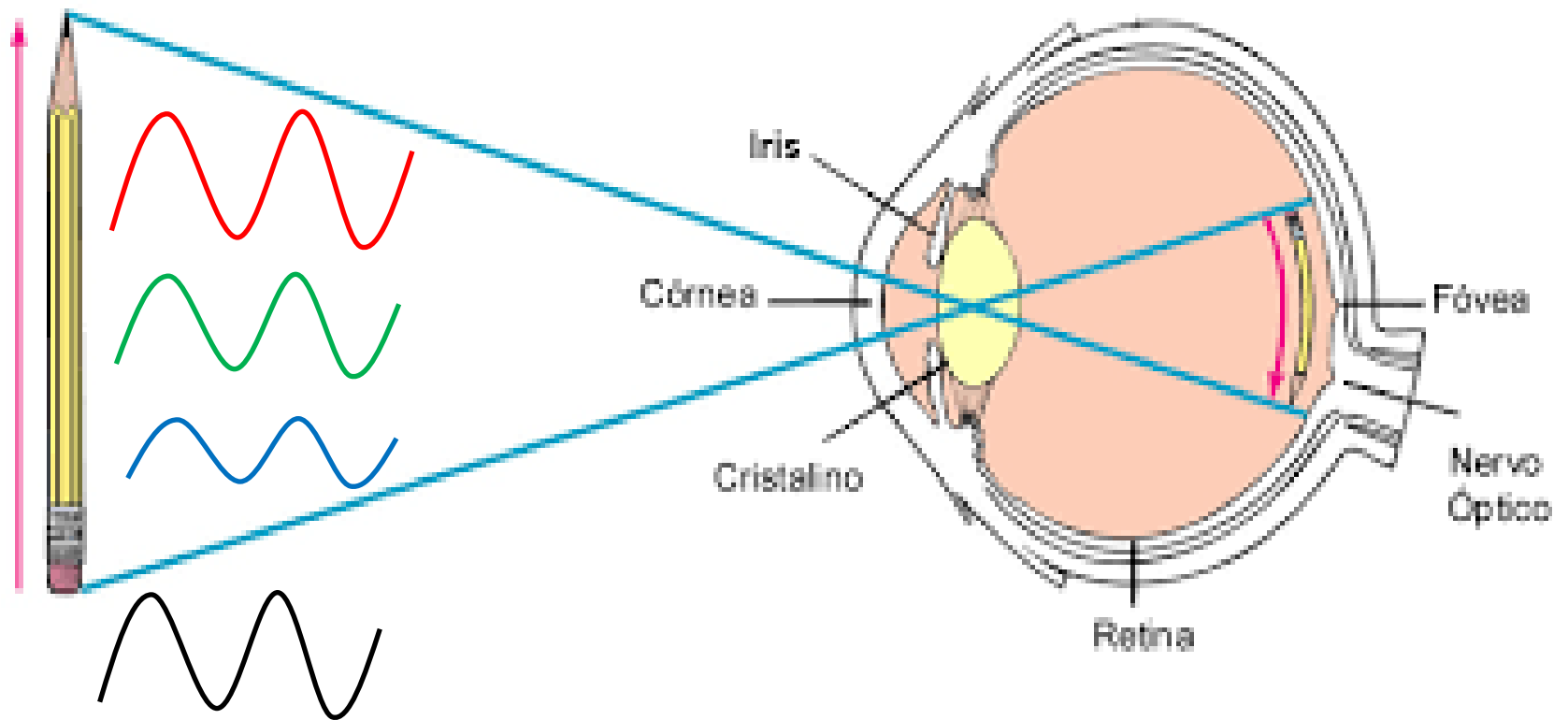


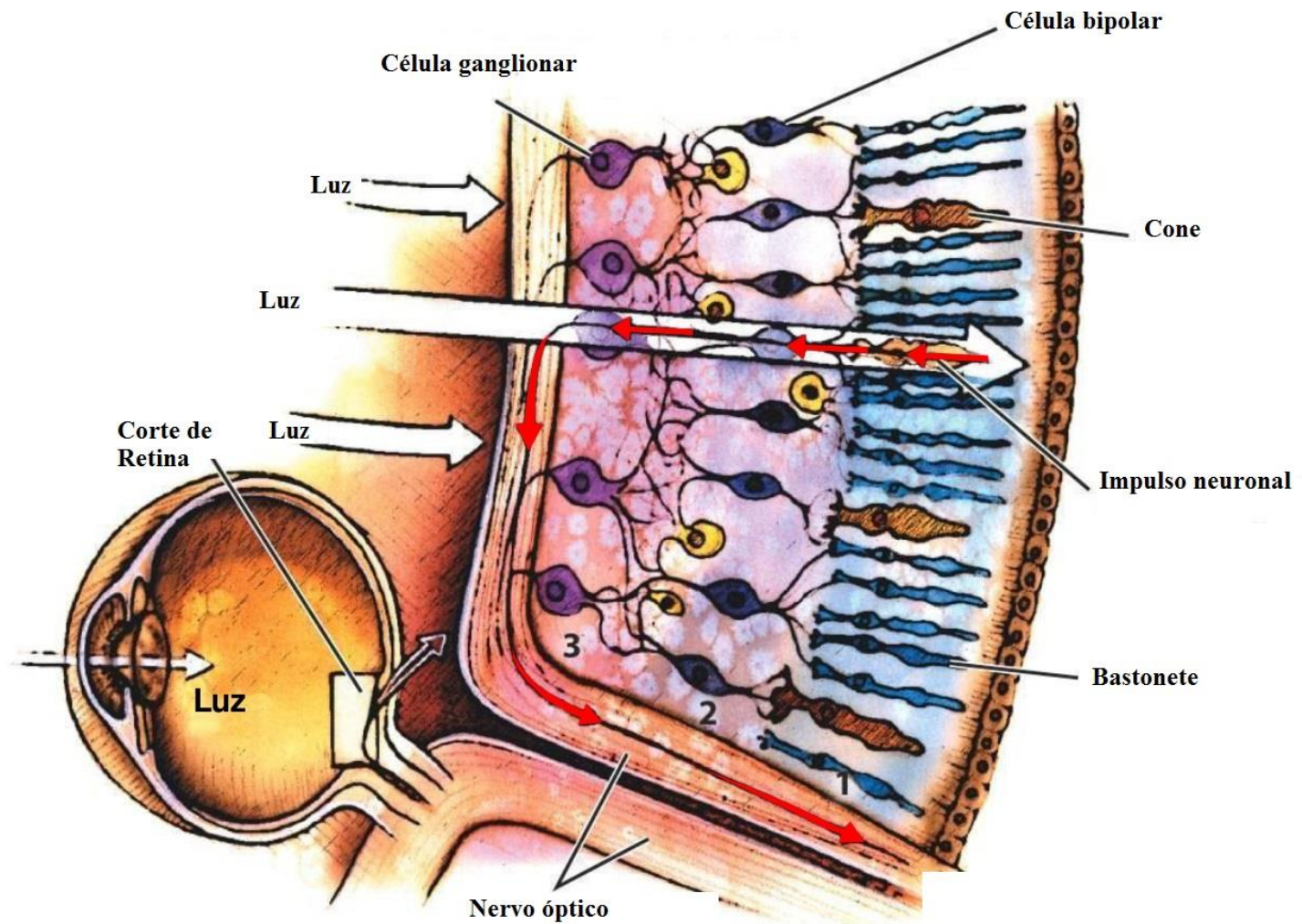
Cores

Luis Rivera

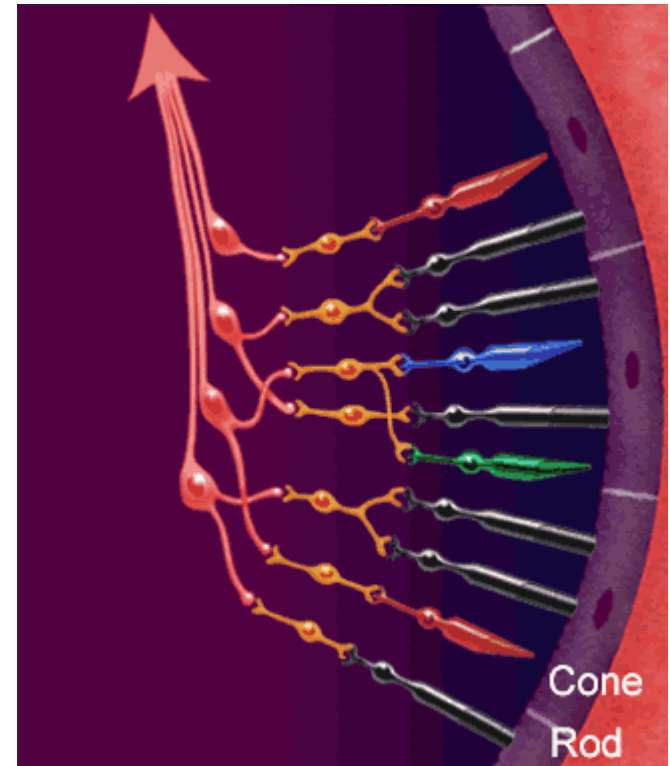
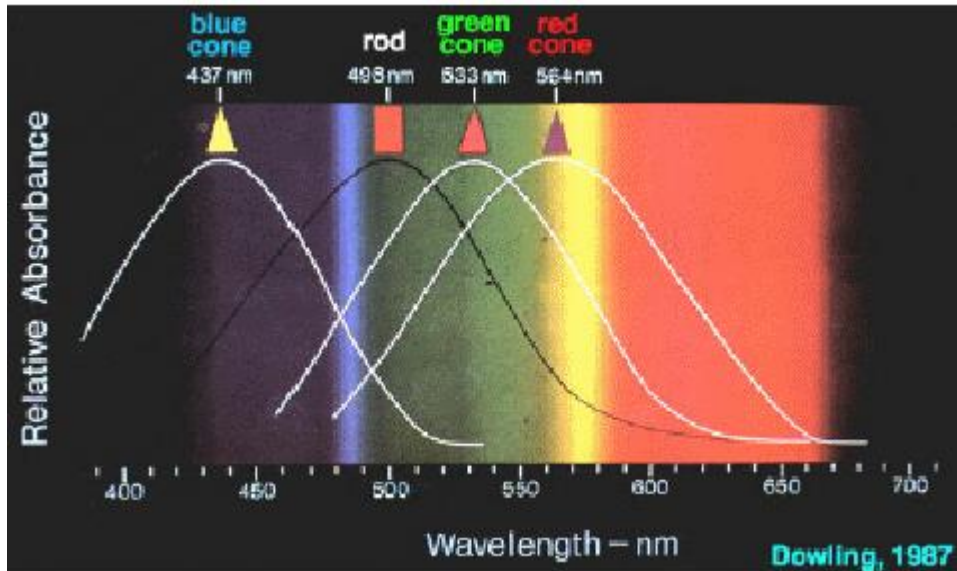
Cores na retina



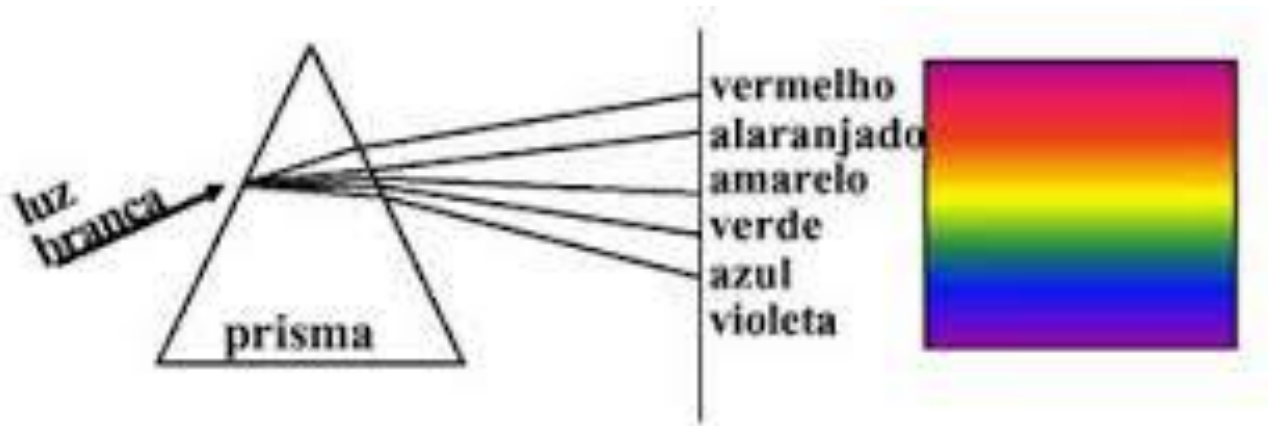
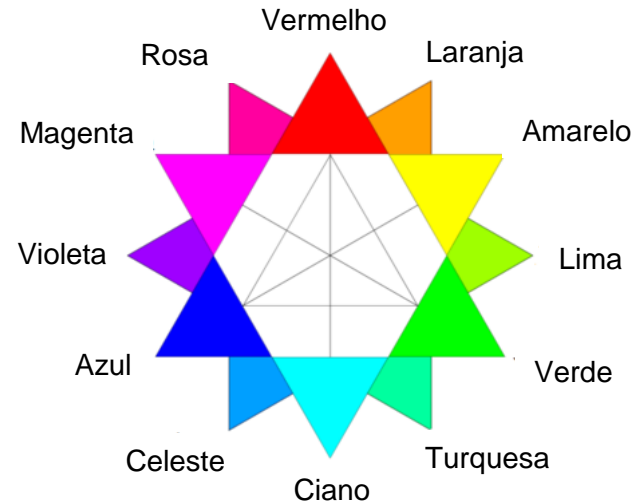
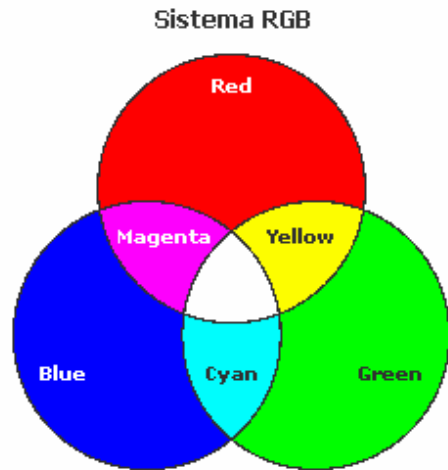
Retina e receptores de ondas



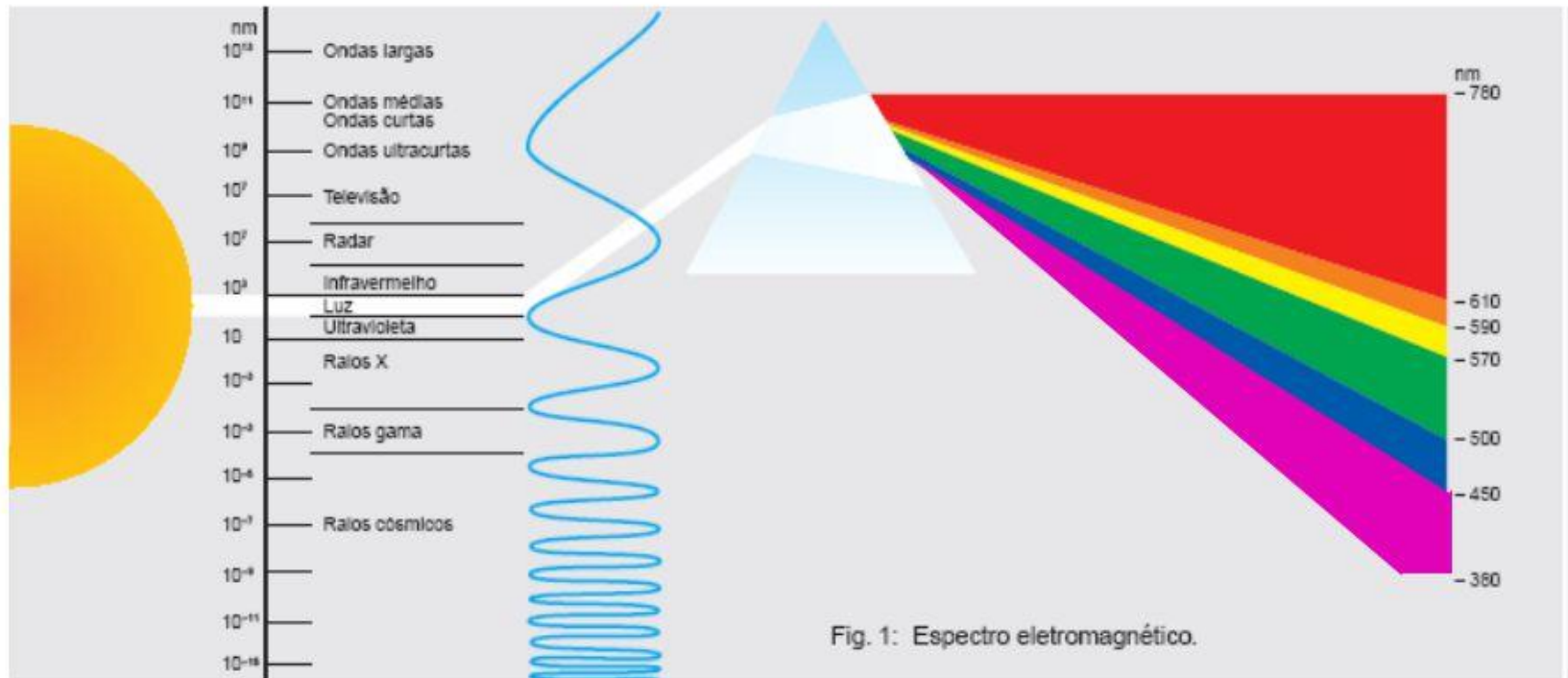
Cores e Cones



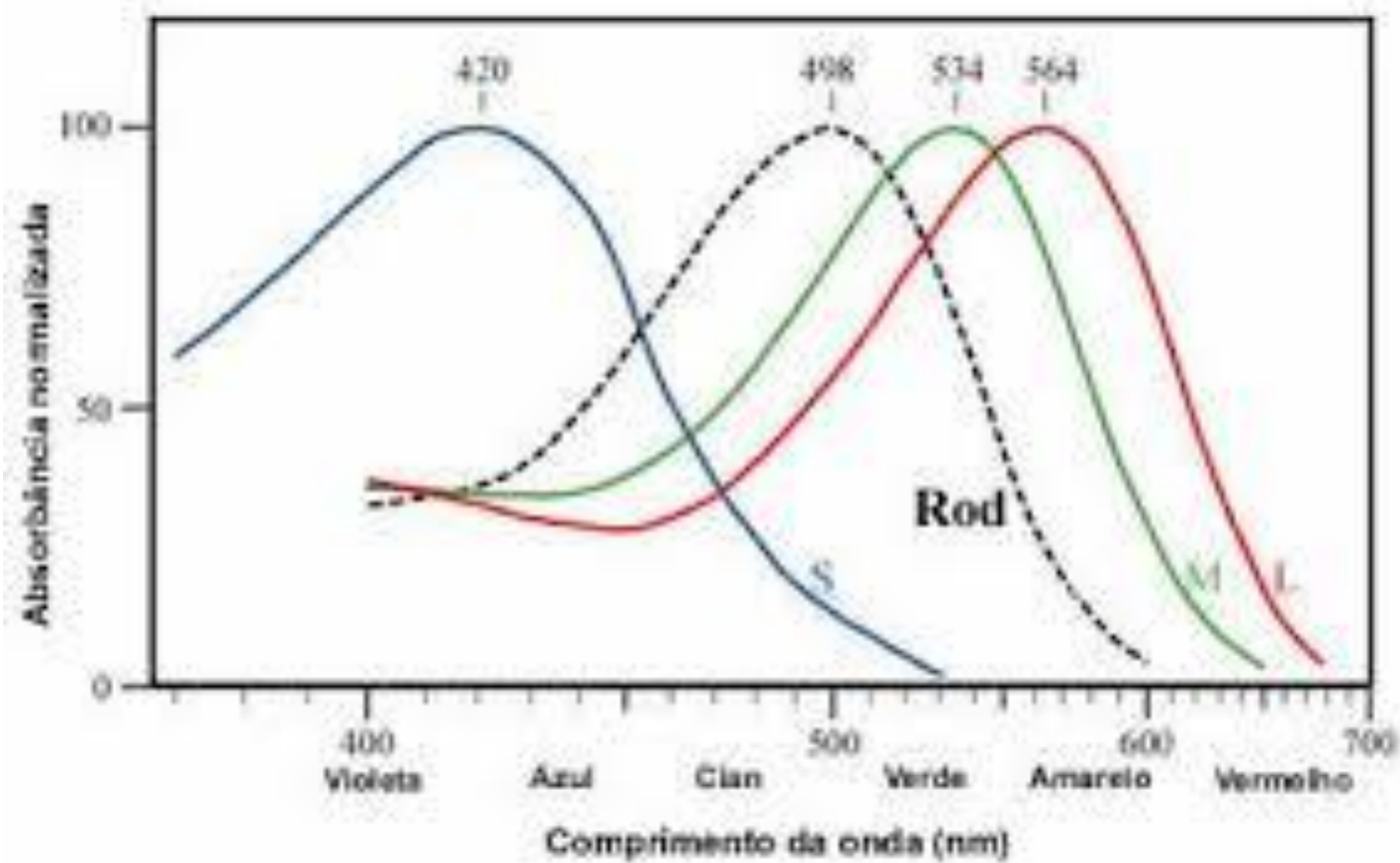
Cores Aditivos: RGB



O que é a luz

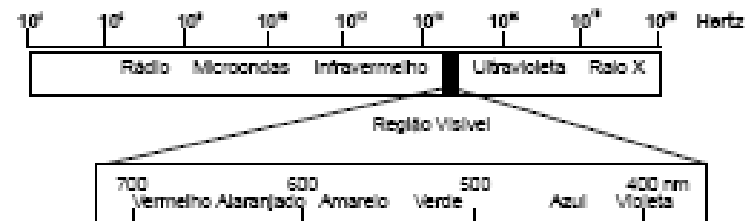
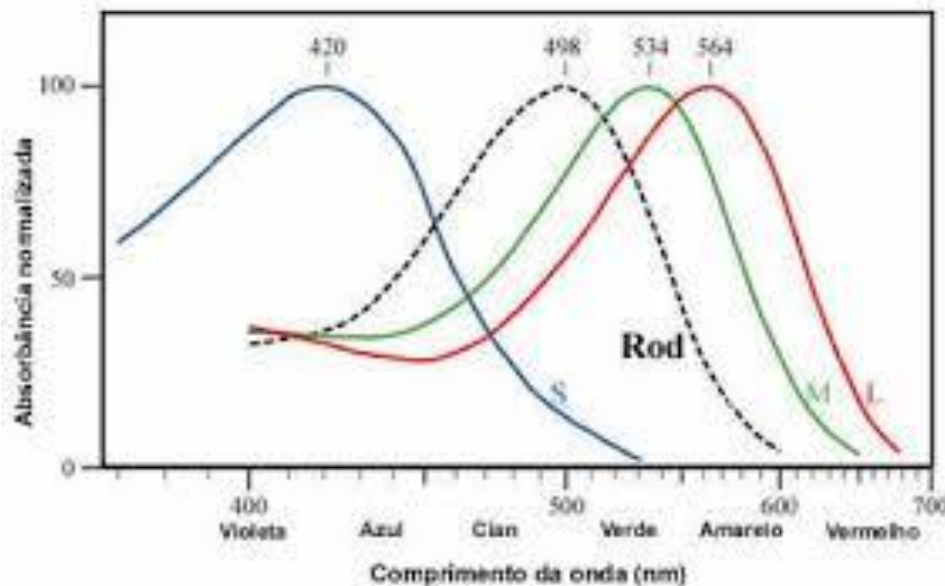
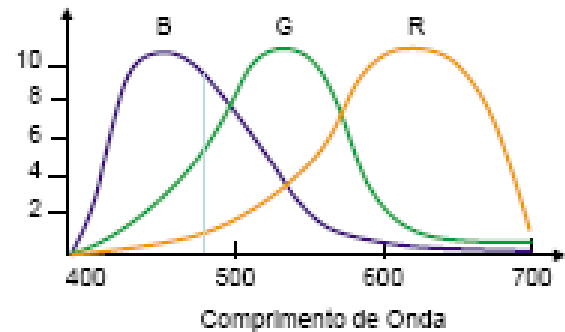


Luz é uma **radiação eletromagnética** capaz de produzir sensação visual. Por outras palavras, é a parte do espectro que podemos ver. Trata-se de uma radiação com comprimento de onda entre 380 e 780 nm (nanómetros), sendo uma parte do conhecido espectro de radiação eletromagnética.



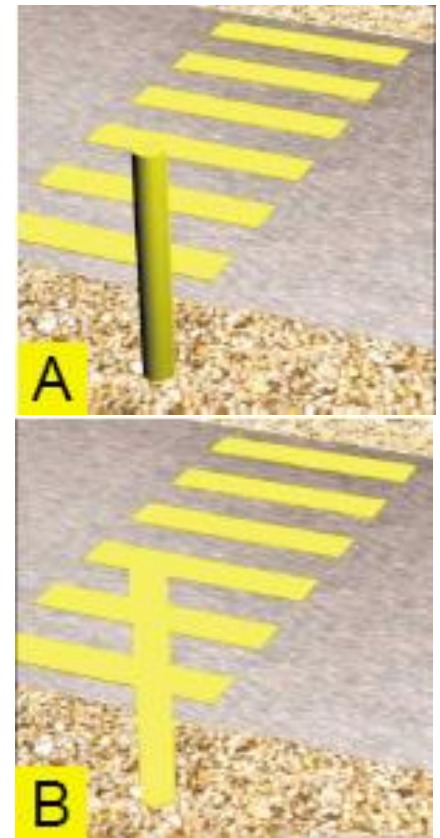
Descrição da Cor de uma Luz

- RGB (físico von Helmholtz)
 - A 480 nm RGB seria em média 1:5:9
- A diferença de cores corresponde a uma pequena faixa de frequências do espectro



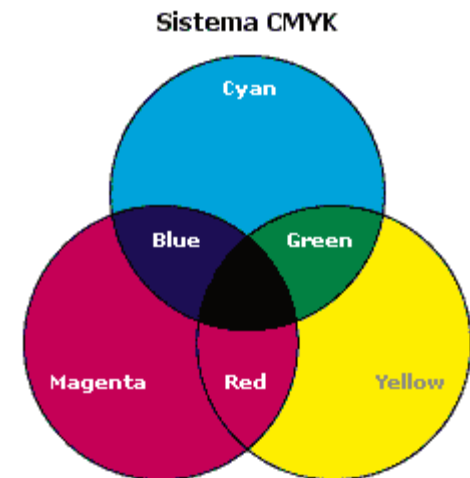
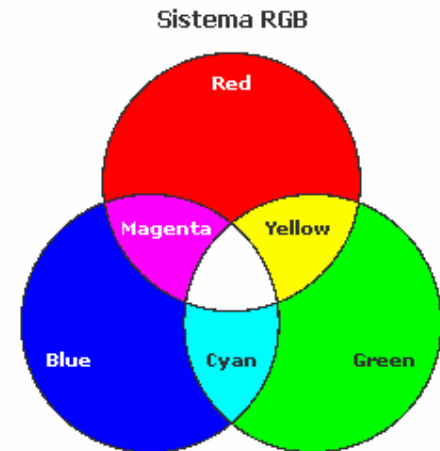
Cores

- Melhora a legibilidade da Informação
- Possibilita gerar imagens realistas
- Permite indicar mecanismos de segurança
- Permite focar a atenção do observador
- Permite passar emoções

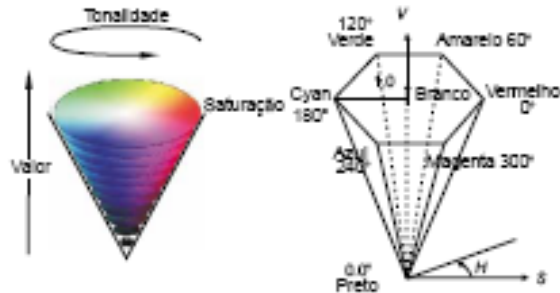


Sistema de Cores Aditivas e Subtrativas

- Aditivas são usadas nos monitores de vídeo e televisores
 - As cores primárias aditivas
 - Vermelho, Verde e Azul
 - Cor de um pixel
 - $C = r.R + g.G + b.B$
 - Para r, r, b coeficientes de mistura
- Subtrativas usadas nas pinturas
 - Cores primarias subtrativas
 - Magenta, Amarelo e Cyan

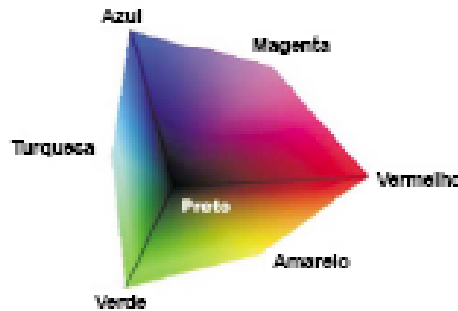


Modelo de Cor



Modelo HSV (Hue, Saturation, Value)

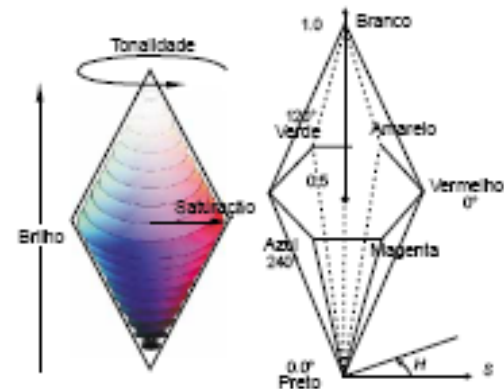
Tonalidade, Saturação e Luminância



Modelo RGB

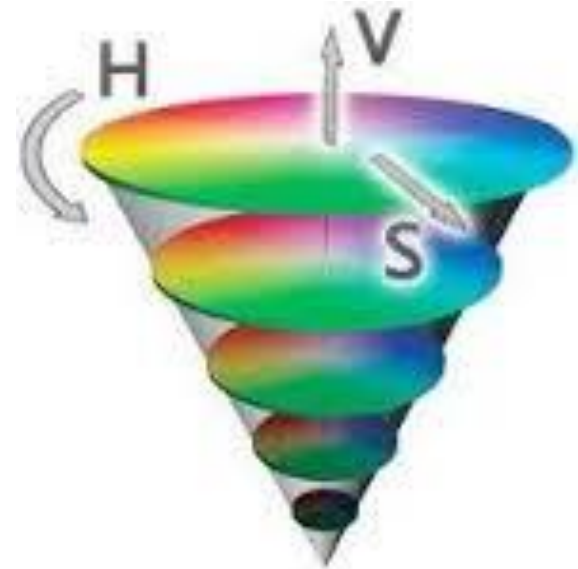
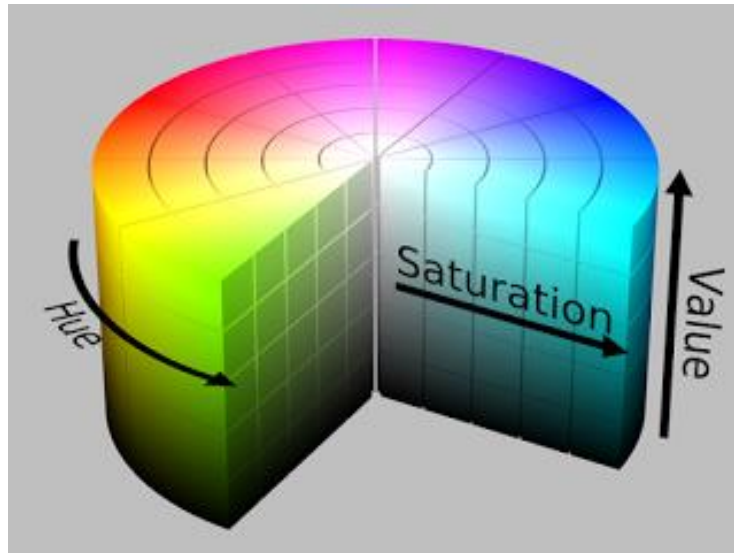
Modelo CMYK (Cian, Magenta, Yellow, blaK)

- Complemento a RGB
- Industria fotográfica, impressoras, etc.

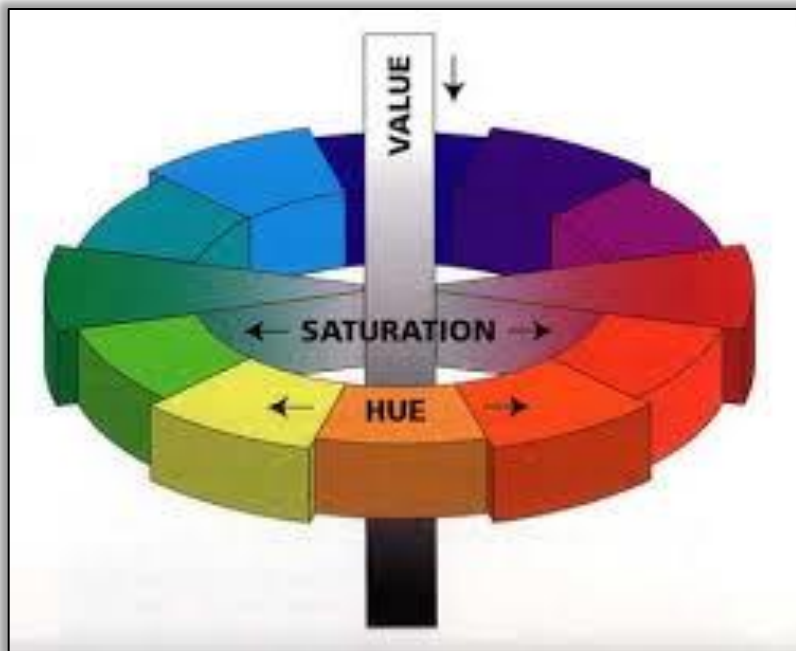


Modelo HLS (Hue, Lightness, Saturation)

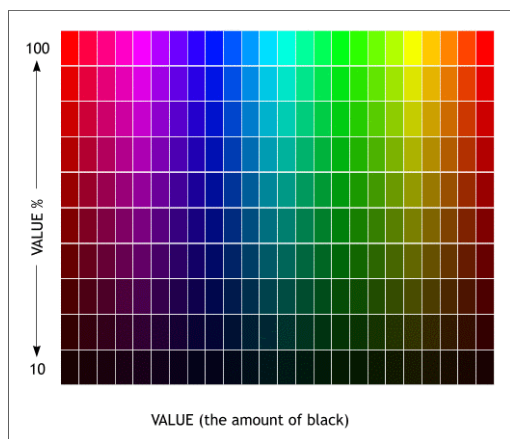
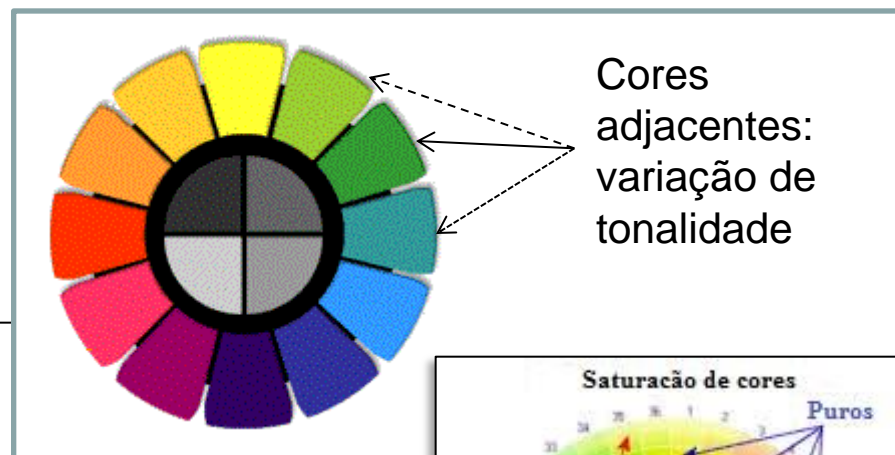
Cores HSV



HUE (Matiz): estado puro da cor. Valores variam de 0 a 360 graus

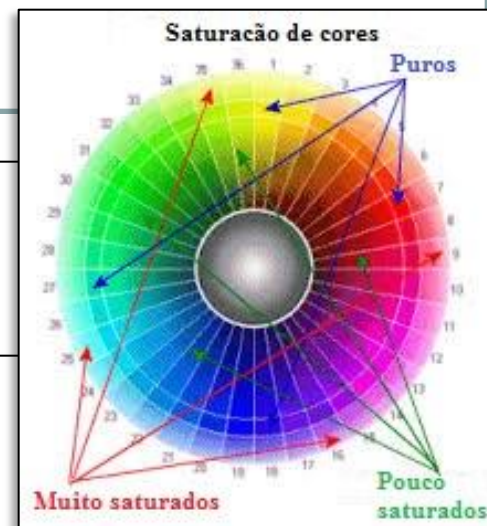


Hue (Matiz): estado puro da cor.
Valores variam de 0 a 360 graus



Saturation (intensidade ou croma):
indica a concentração da cor no objeto

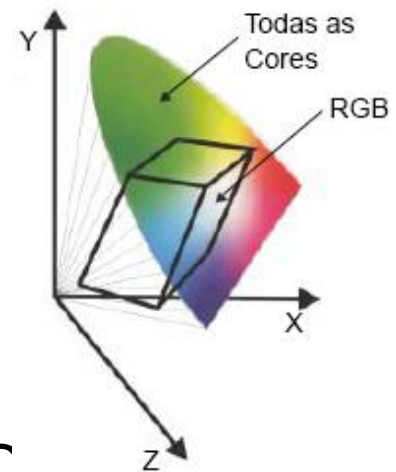
Value (Brilho): quantidade de
claridade da cor



Transformações entre Espaços de Cor

- Transformações lineares ou não lineares
- De RGB para YYZ (linear)

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 0.607 & 0.174 & 0.201 \\ 0.299 & 0.587 & 0.114 \\ 0.000 & 0.066 & 1.117 \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix}$$



- Transformações entre Padrões CIE e NTSC

$$\begin{bmatrix} R_N \\ G_N \\ B_N \end{bmatrix} = \begin{bmatrix} 0.842 & 0.156 & 0.091 \\ -0.129 & 1.319 & -0.203 \\ 0.006 & -0.069 & 0.897 \end{bmatrix} \begin{bmatrix} R_{CIE} \\ G_{CIE} \\ B_{CIE} \end{bmatrix}$$

- R_{CIE} , G_{CIE} , B_{CIE} componentes de R,G,B em padrão CIE;
- R_N , G_N , B_N correspondentes do padrão NTSC