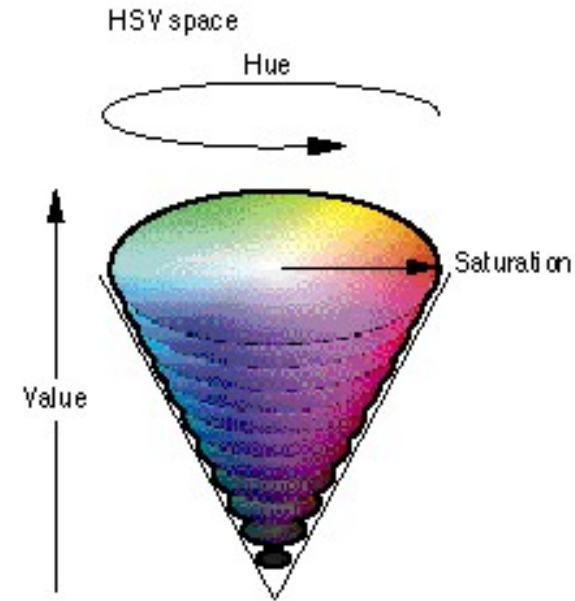




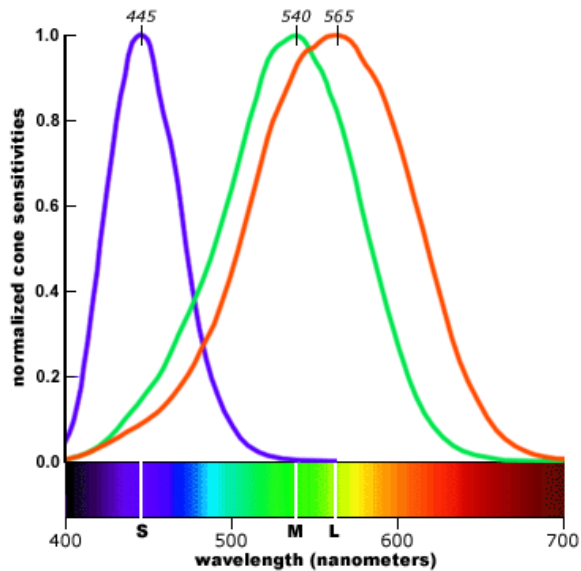
Pictures

Encoding color

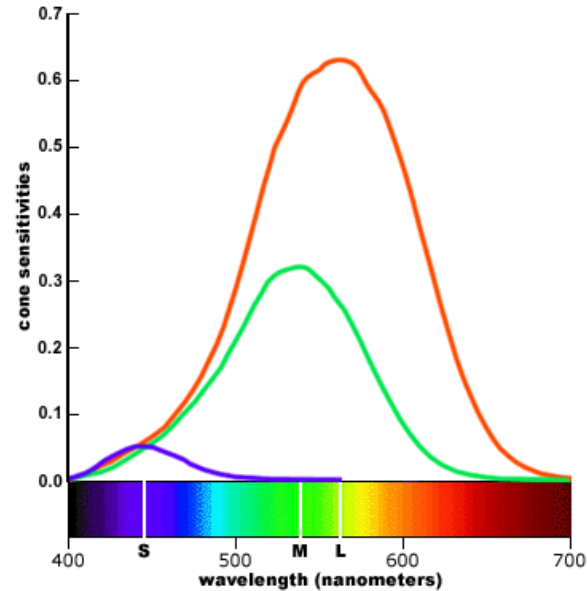
- Each pixel encodes color for that spot in the picture
- There are many encodings for color
 - Printers use CMYK: Cyan, Magenta, Yellow, and black.
 - Humans often prefer HSV (for Hue, Saturation, and Brightness)
- We'll use the most common for computers
 - RGB: Red, Green, Blue



Color Perception – Sensitivity of Cone Cells



NORMALIZED



UN-NORMALIZED

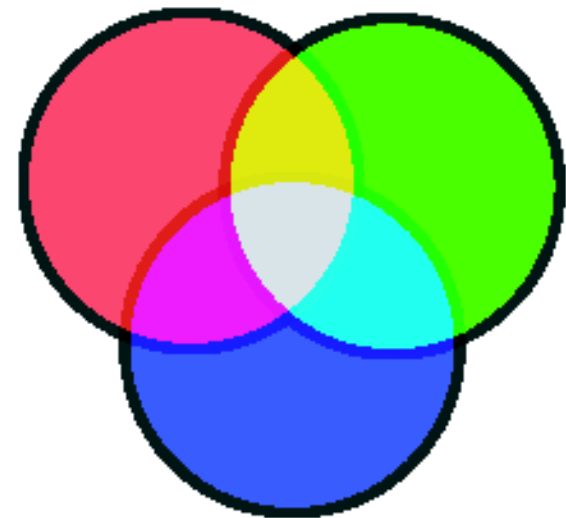
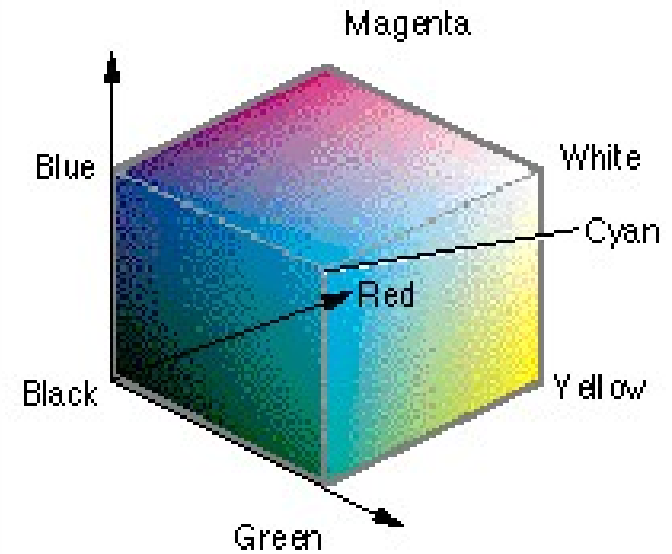
Images from: <http://www.handprint.com/HP/WCL/color1.html>

Original data from: Stockman & Sharpe (2000)

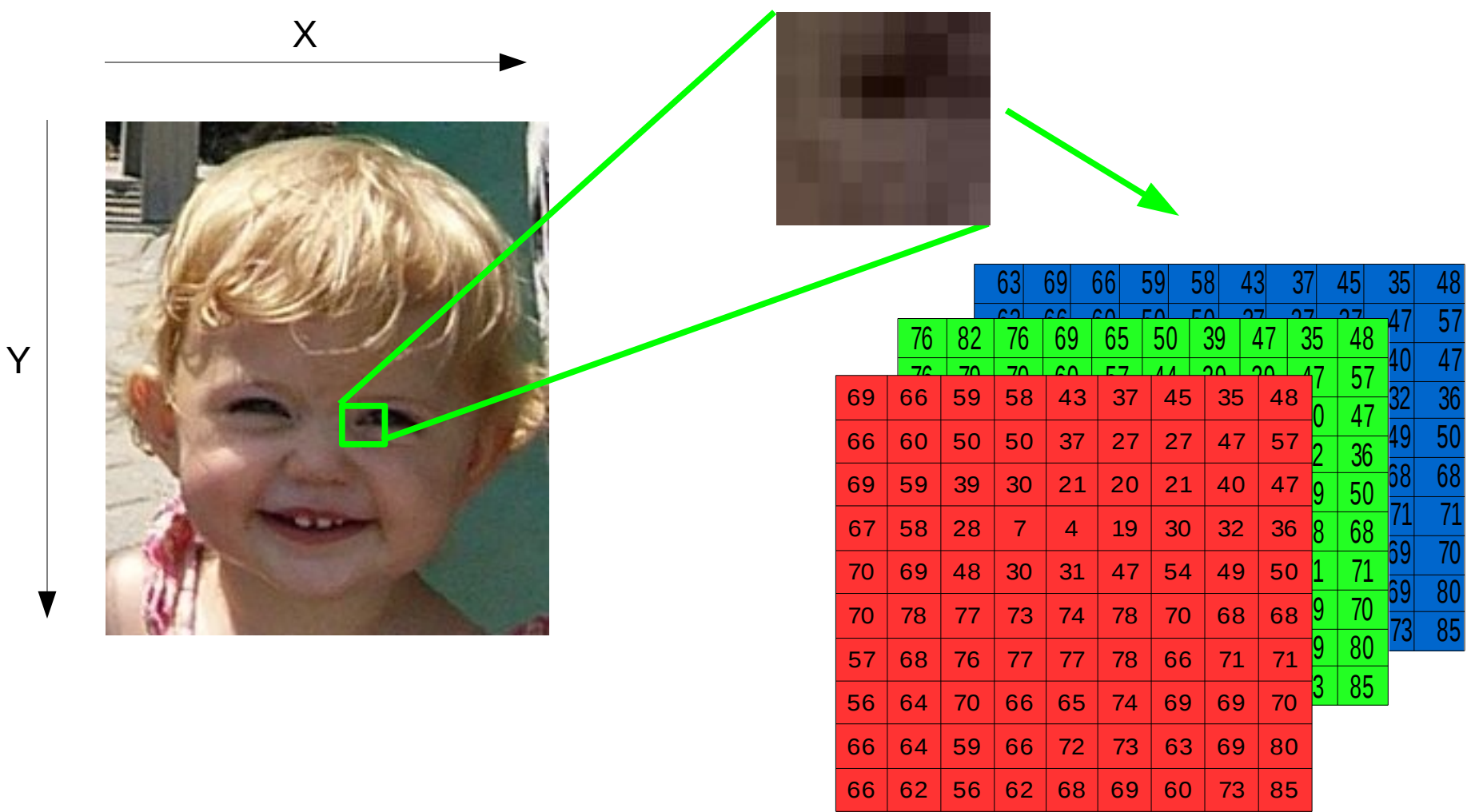
RGB

- In RGB, each color has three component colors:

- Amount of red
- Amount of green
- Amount of blue



Pictures/Pixels





Pixels

- The individual pixel elements are referred to as pixels.
- In a gray scale image, each pixel is typically represented with one byte (8 bits).
- How many possible values?

Color Pixels

- In a color image, each pixel is typically represented with three bytes one for each of the red, green and blue components
 - 24 bits per pixel
 - 16,777,216 different colors.
- One smallish image might have
 - $1280 \times 1024 = 1,310,720$ pixels.
 - $1,310,720 \times 24 = 31,457,280$ bits.
 - $31,457,280 / 8 =$ (about) 4MB.
- Typically some sort of compression is used.
 - JPEG, etc.



JES Pixels

- JES provides a pixel data type that has:
 - x,y position
 - R, G, B values
- Let's look at JES...