Colour

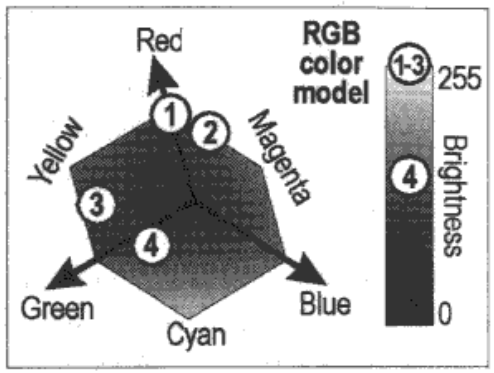
- Colour Models
- Colour Depth
- Palettes
- Hexadecimal Notation
- Printers

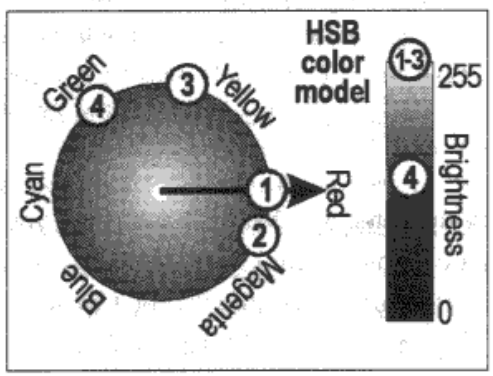
3 Colour Models

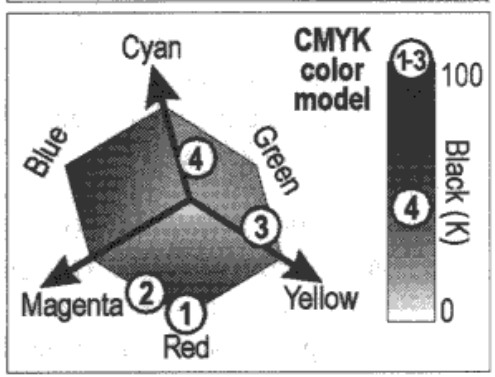
- RGB
  - Red, Green, Blue
  - additive model
    - A colour of (255,0,0) would be pure red
      - assuming a scale of 0 to 255 more about this later in notes
- CMY and CMYB
  - Cyan, Yellow, Magenta / blacK
  - subtractive model light is modified by being passed through clear liquid crystal covered by array of coloured dots or through 3 layers of colour liquid crystals
  - printing as pure blacK gives a better colour than mixing

3 Colour Models cont

- HSL/HSB
  - Hue, Saturation, Lightness/Brightness
    - used by TV monitors







1 pure bright red

2 rose

3 New leaf green

4 forest green

Colour depth

- Colour depth is the number possible colours for each pixel
  - 8 bit - 8 bits per pixel
    - $2^8 = 256$ colours
  - 16 bit
    - 64,000 colours approx
  - 24 bit
    - 16.4 million colours approx

Video Cards

- How much video image RAM is needed?
  - Say the image resolution is 640 pixels by 480 lines and has 24 bit colour. How much video image RAM does the video card need?

    640 x 480 - 307,200 pixels

    307,200 x 3 = 1MB approx
  - Question
    - How much video image RAM is needed to display 640 by 480 pixels at 4 bit colour? (This is VGA - Video Gate Array)
      - Ans (640 x 480 x 4)/8 Remember the answer must be in Bytes
      - 150KB so card must be 256KB (as RAM chips hold a number of bits that is some integer power of 2)

Palettes

- Web Safe "browser-safe" palette
  - 216 colours - uniform look on any computer
  - 216 = 256 - 40 used for operating system
- Adaptive Palettes
  - browser will use this when loading an image which doesn't fit its palette
- Exact Palette
  - uses the colours currently being used in an image
  - if too many colours can dither or change some colours to similar colours

Hexadecimal Notation

- HTML uses hexadecimal notation when describing colours.
  - 1 Byte to describe 256 colours
  - 00h to FFh gives 0 to 255
  - 3 bytes gives 256 x 256 x 256 = 16 million colours approx.
  - Web safe uses combinations of 00, 33, 66, 99, CC and FF.

Decimal	**0**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Bit		0001	0010	0011	0100	0101	0110									

Printers and Plotters

- Impact or Nonimpact
- Impact
  - computer-driven typewriters eg golf ball or daisy wheel
    - new font requires new ball or wheel
  - Dot matrix
    - slow and poor quality
  - Line printers
    - quick, new font requires new hammers, durable

Nonimpact Printers

- Xerographic printers eg Laser
  - works like a photocopier (howstuffworks.com)
  - colour
- Squirting Ink Printers eg Inkjet
- Hot wax printers
- Dye Sublimation printers
  - treated paper is heated, high quality

Nonimpact Plotters

- Pen plotters
  - wet-ink, ball point, felt-tip
  - paper can be ono flat bed, drum
  - paper held by clamps, vacuum or electrostatic charge
  - good for large drawings.