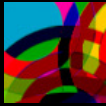


# images and graphics

considerations when designing for web and print





- > visual disabilities
- > graphics screen (predominantly) and print based
  - > pixels, dimensions, resolutions
- > different types of graphic
- > common file types and the compression of these
  - > .gif, .jpg, png
- > colour schemes
- > colour theory
- > colour models

what will be covered



- > poor eyesight or colour blindness
- > 1 in 12 who use the web
- > 8% of men
- > 0.4% of women
- > red and green pose particular problems
- > try these resources
  - > <http://vischeck.com/examples/>
  - > <http://www.colormatters.com/entercolormatters.html>



- > picking the correct colour is **hugely** important
- > influences **mood**
- > make webpages more or less **accessible**
- > often **used badly** in user interface design
- > make print-based materials more
  - > readable
  - > scan-able

choosing the correct colour



- > **pink:** soothes, acquiesces; promotes affability and affection
- > **yellow:** expands, cheers; increases energy
- > **white:** purifies, energizes, unifies; in combination, enlivens all other colours
- > **black:** disciplines, authorizes, strengthens; encourages independence
- > **orange:** cheers, commands; stimulates appetites, conversation,
- > **red:** empowers, stimulates, dramatizes, competes; symbolizes passion
- > **green:** balances, normalizes, refreshes; encourages emotional growth
- > **purple:** comforts, spiritualizes; creates mystery and draws out intuition
- > **blue:** relaxes, refreshes, cools; produces tranquil feelings and peaceful moods

so what does it all mean?



- > smallest element of an image
  - > web measurement
  - > can be managed by a computer's graphics system
- > screen graphics
  - > colour dots are actually built up from three separate sub-dots that represent the primary colours of red, green and blue (RGB)
  - > the three RGB dots together make a pixel
- > print-based graphics
  - > use cyan, magenta, yellow and black (CMYK)



it's all in a pixel (px)



- > default of 72 pixels per inch – perfect for screen
  - > 300 ppi for print
- > overall size and integrity of the image
- > RGB colour mode for webCMYK for print
- > ensure greyscale is not selected



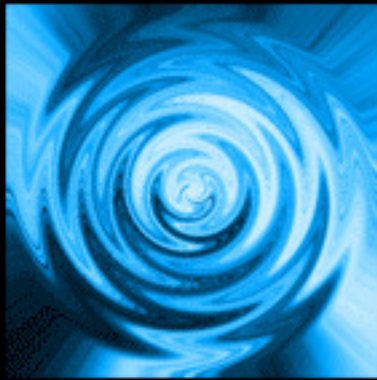
dimensions and resolutions



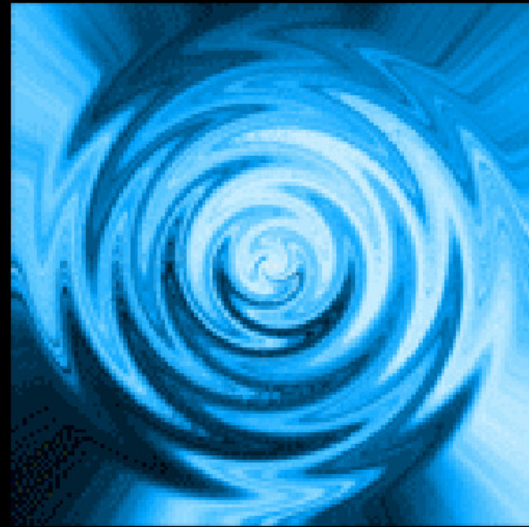
- > **bitmaps** or **rasters** are made up of a grid of dots known as pixels
- > you edit pixels rather than objects or shapes
- > most common electronic medium for continuous-tone images
- > bitmap images lose detail when re-scaled on-screen
  - > resolution dependent
  - > contain fixed number of pixels
  - > each pixel given an a specific location
  - > supported in PhotoShop
    - > **.gif .tiff .bmp .png**

bitmaps and raster images



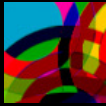


original is ok



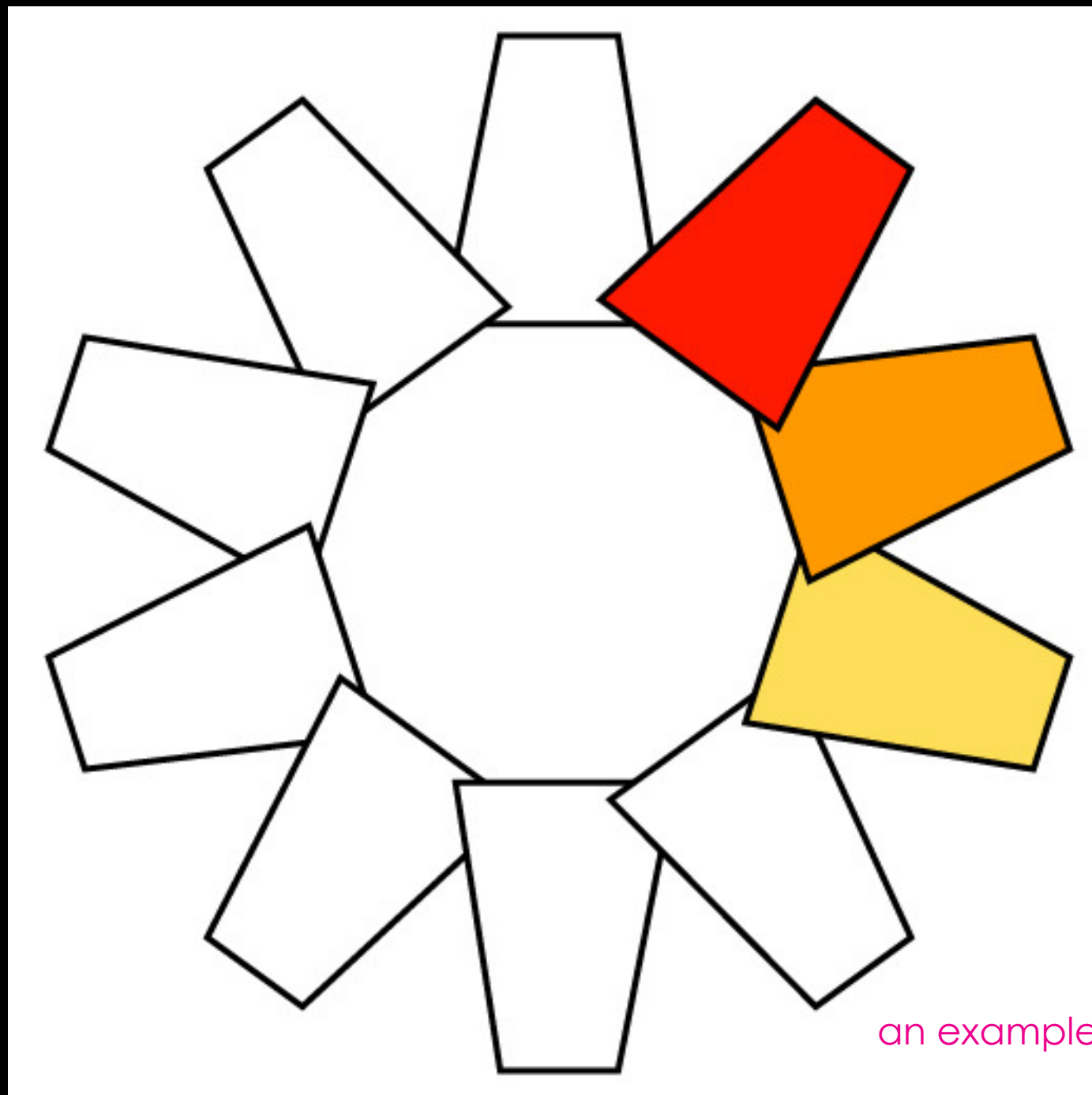
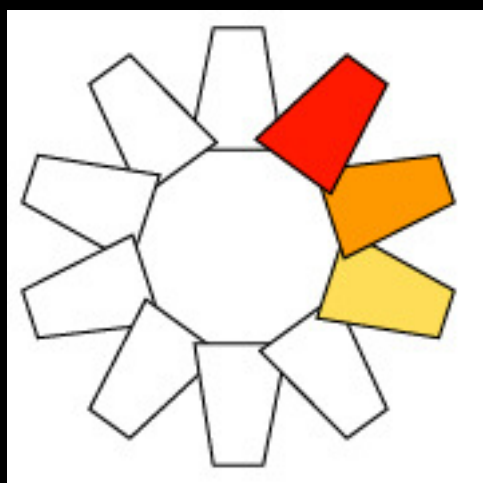
rescaled distorts

an example



- > **vector** images are made up of mathematically defined lines and curves known as vectors
- > you can move, resize or change the colour of the line without losing the quality of the graphic
- > **resolution-independent**
  - > no loss of detail or clarity
  - > best choice for representing bold graphics that must retain crisp lines i.e. corporate logos

vector images



an example



- > used to optimize images for the web
- > appropriate
  - > colour
  - > size
  - > format
    - > **.gif** graphics interchange format
    - > **.jpeg** joint photographic experts group
    - > **.png** portable networks graphic
    - > **.wbm** wireless bitmap image



- > the **.gif** is best used for
  - > bitmap images (.bmp)
  - > line art
  - > images with large areas of solid colours
- > colour depth
  - > 1-bit (2 colours) to
  - > 8-bit (256 colours)
- > supports
  - > transparency
  - > limited animation
- > file sizes are typically 20%-90% of original size



copyright G. Inkster 2009

graphics interchange format (gif)



- > the **.jpg** format is best used with
  - > more complex photo-realistic images
  - > colour patterns
- > colour depth of either
  - > 8-bit (256 colours) or
  - > 24-bit (16,777,216 colours)
- > allows for quality control set in percentage
- > file sizes are typically 5%-20% of original size



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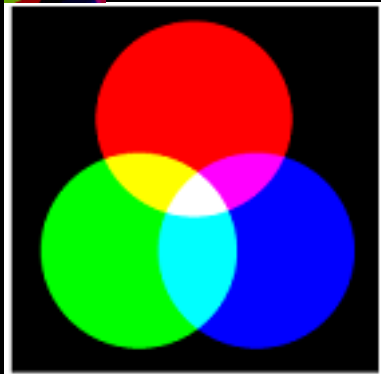
joint photographic experts group (jpg)



- > the **.png** format was developed as a successor to the .gif
- > intended to replace it but adoption has been slow
- > not all of its features are supported by all browsers
- > colour depth of either
  - > 8-bit (256 colours) or
  - > 24-bit (16,777,216 colours)
- > support for
  - > alpha channels with variable transparency
  - > cross-platform gamma correction (control of image brightness)
  - > interlacing file sizes typically compresses images 5% – 25% better than

copyright G. Inkster 2009

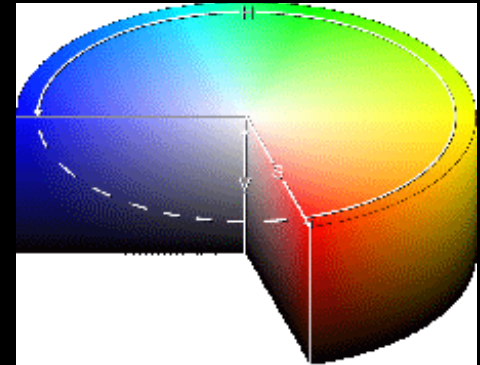
portable network graphic (.png)



RGB



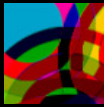
CMYK



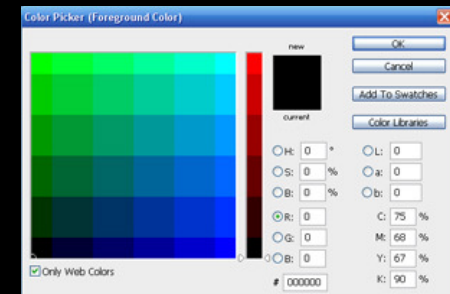
HSB

colour models





- > monitor usage on the web
  - > **50%** use 24-bit = 16,777,216 colours
  - > **40%** use 16-bit = 65,536 colours
  - > **10%** use 8-bit = 256 colours
- > if colours are out of range then they can
  - > mix two colours **dithering**
  - > use the next in the set **shift**

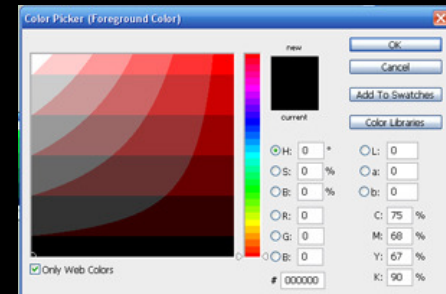


web or browser safe colours

image colour amd monitor usage



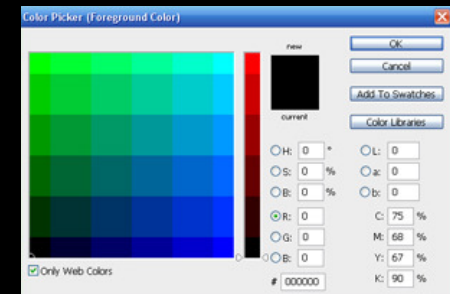
- > hue/saturation/brightness
- > colour picker
  - > default setting in PhotoShop
- > hue=colour, measured on the colour wheel in degrees
- > saturation=strength of the colour measured as a percentage from 0% (grey) to 100% (fully saturated colour)
- > brightness=relative lightness of the colour measured as a % from 0% (black) to 100% (white)



web or browser safe colours

colour models: hsb

- > graphics are made up of pixels represented by three colour signals:
  - > Red, Green, Blue (RGB)
- > computer monitors **emit colour** as RGB
- > mixing these three primary hues in different quantities can produce every conceivable colour



web or browser safe colours

colour models: rgb



“Hexadecimal [hex] is a base 16 number system, useful in computing because 8 bits [1 byte of memory] can be represented by a single number or letter.”

- > combination of 6-digits
- > numbers 0-9
- > letters a-f

this represents the amount of RGB values respectively

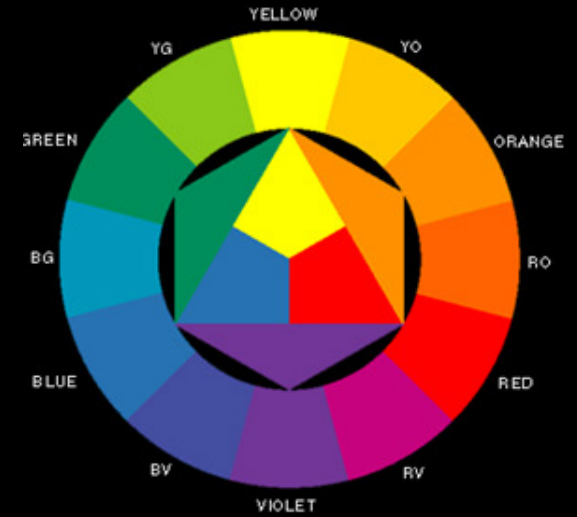
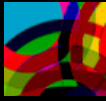
i.e. hex #ffffff = 255, 255, 255 = white



- > Cyan, Magenta, Yellow and black
- > printing inks for paper
- > uses %
- > partially or fully masks certain colours usually on a white
- > background



cmym colour system



- > basic tool used when working with colours
- > based on the standard colour theory known as Brewster/Prang
- > when more detailed colours are required there are two colour systems
  - > The Munsell System
    - 5 principles hues and 5 intermediate hues. Numbering system helps designers identify the exact hue they require
  - > The Ostwald System:
    - Made from pairs of complementary colours.
    - 24 hues in the colour wheel

the colour wheel



- > design your webpage in black and white first
- > then add colour later when it adds value to your webpage
- > utilize web resources such as [colorlovers.com](http://colorlovers.com)
- > red/blue together causes eye strain
- > yellow text on a white background isn't easy to read

some tips