Introduction to Publishing

Colour design

References

"The Non-Designers Scan and Print Book"
- Chapter 9 Process colour printing

"The Non-Designers Design Book" 3rd edition
- Chapter 7 Using Colour

"The Complete Guide to Colour", Tom Fraser and Adam Banks

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Colour Theory

In Traditional Art the Colour Wheel is based on Red, Yellow and Blue.



In Screen Media the Colour Wheel is based on Red, Green and Blue.

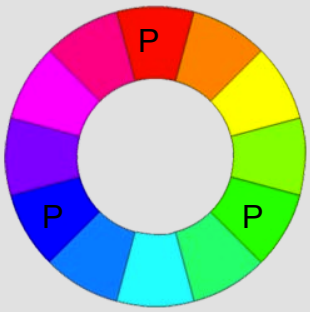


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Primary Colours

In color theory, these are the 3 colours that can not be mixed or formed by any combination of any other colours.

All colours are derived from these 3 primaries.

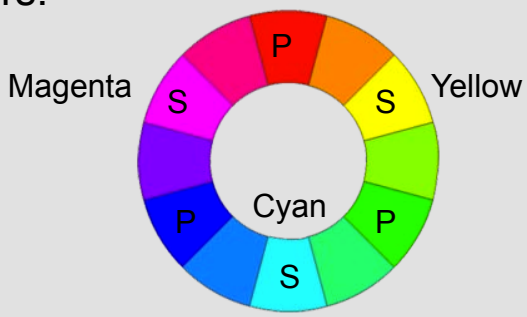


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Secondary Colours

Cyan, Magenta and Yellow are Secondary colours

They are formed by mixing the Primary colors.



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Tertiary Colours

Colours are formed by mixing a Primary and a Secondary color.

Hue has a two word name or a common name.

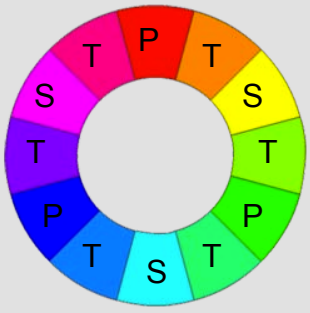
Red-yellow (orange)

Green-Yellow (chartreuse green)

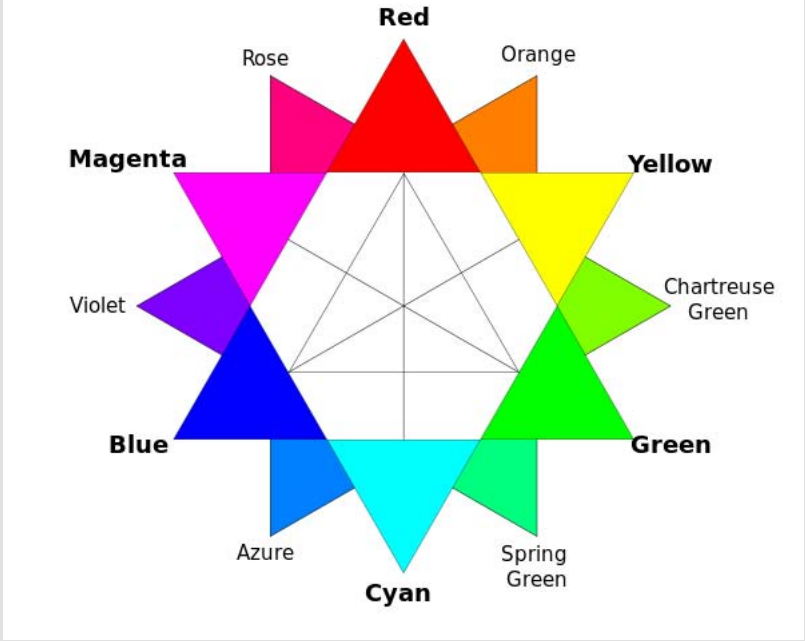
Green-Cyan (spring green)

Cyan-Blue (azure),
Blue-Magenta (violet)

Magenta-Red (rose)

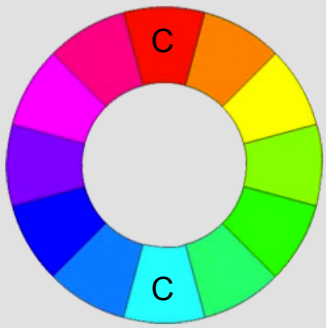


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Complementary Colour Schemes

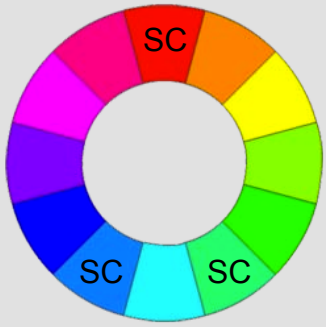
Colours that are opposite each other on the color wheel (example: red and cyan).



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Split-Complementary Colour Schemes

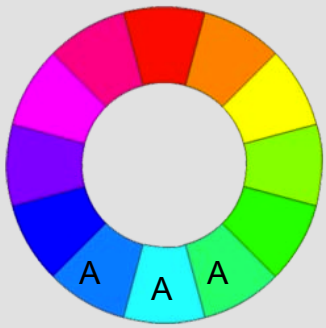
A variation of the complementary color scheme. The base color (red here) uses the two colors adjacent to its complement.



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Analogous Colour Schemes

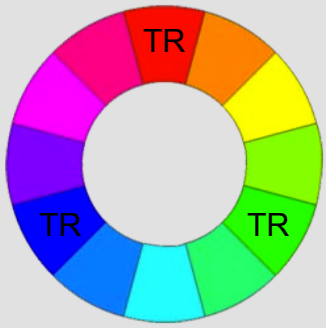
Colours that are next to each other on the colour wheel.



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Triadic Colour Schemes

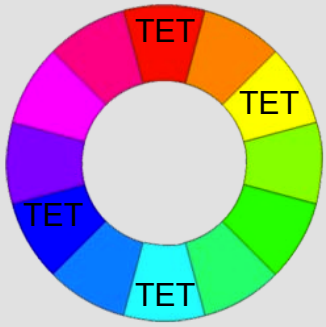
Colours that are evenly spaced around the color wheel.



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Rectangular (Tetradic) Colour Schemes

The rectangle or tetradic color scheme uses four colors arranged into two complementary pairs.



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Square Colour Schemes

The square color scheme is similar to the rectangle, but with all four colors spaced evenly around the color circle.

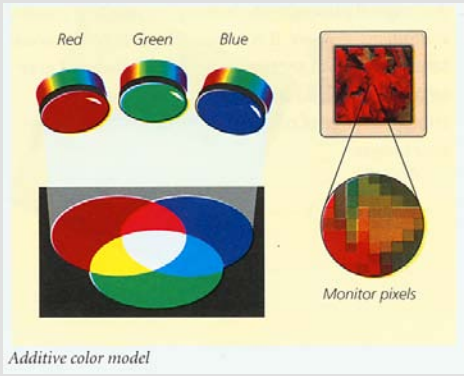


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Colour display and printing technologies

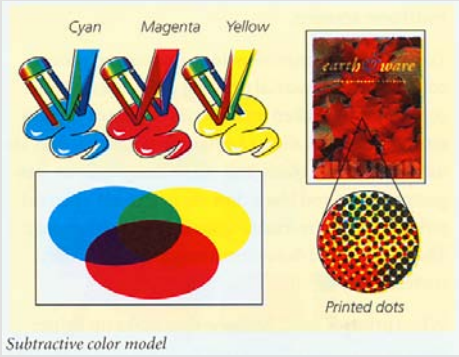
- Photographic images consist of millions of subtle shades of colour
- Different devices have different ways of reproducing colour ranges
- Printers reproduce colours on a page using coloured and black inks
- Computer screens reproduce colours on the screen using coloured light ‘guns’

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Additive color model

The RGB 'Additive' Colour Model



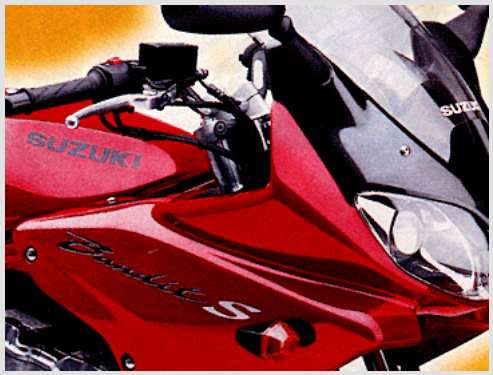
Subtractive color model

The CMK Printing 'Subtractive' Colour Model

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What is a *Continuous Tone* image?

- An image that displays continuous colour (or gray for a black and white photograph), at all viewing magnifications
- An original photograph or slide (transparency)



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What is *halftone screening*?

A printing technique for reproducing continuous tone images onto the printed page

The image is broken down into a series of dots by the halftone screen

The dots control where and by how much the printing ink is applied to the paper

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More on *halftone screening*

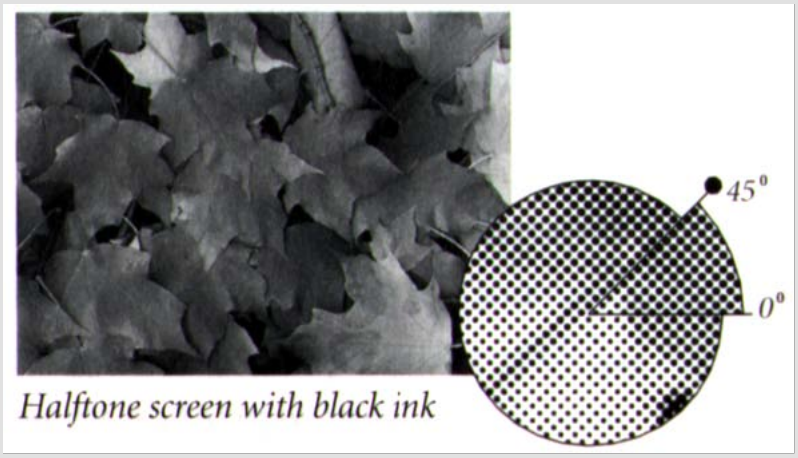
Varying the size and density of halftone dots creates the optical illusion of seamless colour, or gray, in the printed image

Screens are specified by their angle (e.g. a 45° screen) and their density (screen ruling or lines per inch)

Postscript laser printers use halftone screens for printing images

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Black and White halftone screen



Halftone screen with black ink

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Comparison of low and high B/W halftone screen rulings



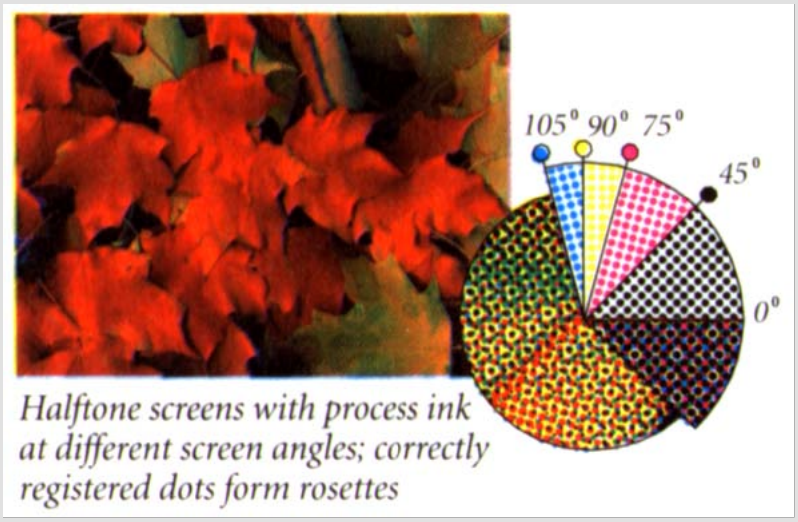
Low screen ruling: 50 lpi



High screen ruling: 175 lpi

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Colour halftone screen



Halftone screens with process ink at different screen angles; correctly registered dots form rosettes

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Comparison of low and high Colour halftone screen rulings



Low screen ruling: 100 lpi



High screen ruling: 175 lpi

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What is *CMYK*?

Coloured inks used for full colour images

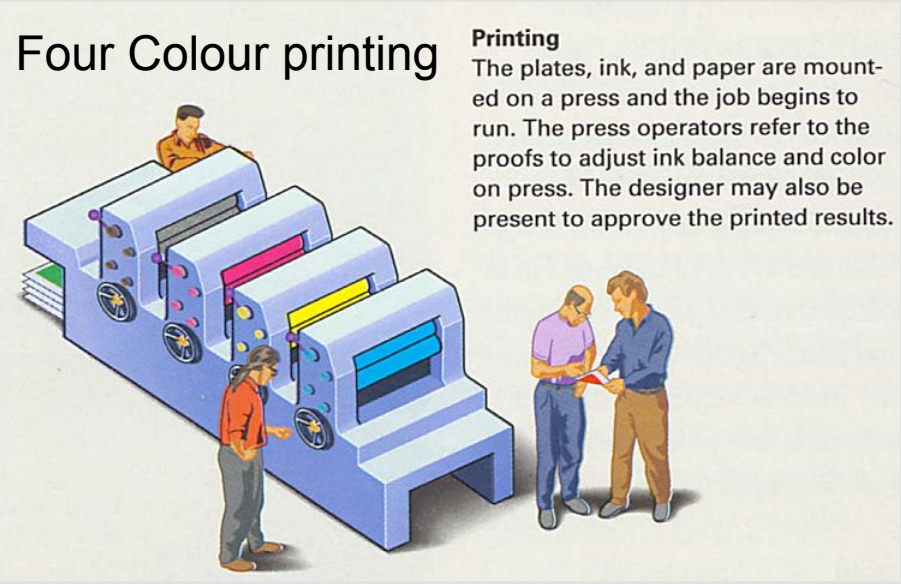
- C (cyan) M (magenta) Y (yellow) K(key, usually black)
- Each colour is printed onto the printed page using an halftone screen

CMYK colours are specified in DTP programs

C,M and Y when mixed together form a muddy brown, therefore black ink is usually added to the printing process

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Four Colour printing



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CMYK Printing Plates



Y(ellow)

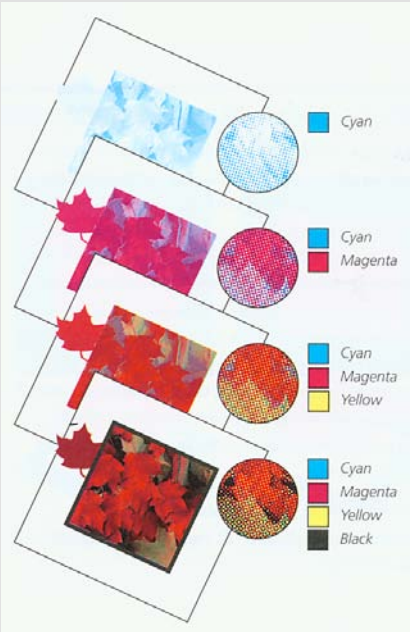
M(agenta)

C(yan)

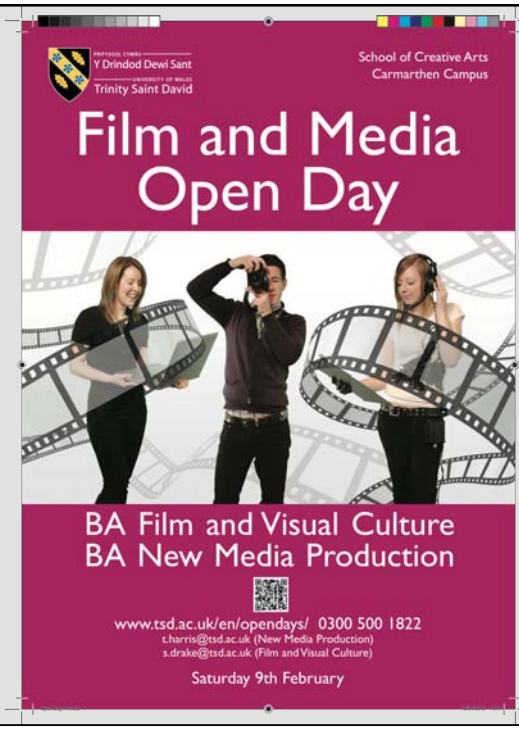
K(ey) colour, usually Black

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Overprinting CMYK plates to create a full colour image



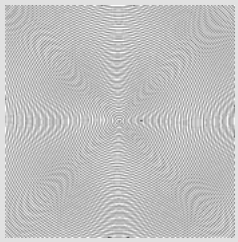
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Avoiding Moiré Patterns

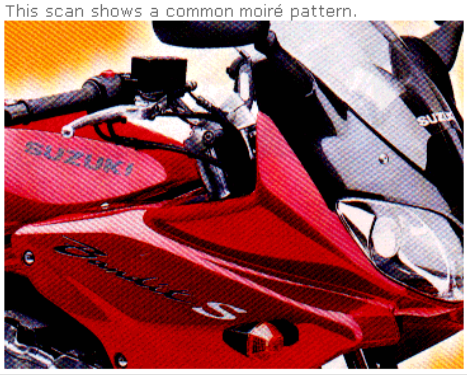
- Failure to Descreen will produce a 'Moiré Pattern' when you print the image
- This is the technical term for the 'clash' of halftone screens
- Can produce a banded or dotted appearance



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An example of a Moiré pattern

This scan shows a common moiré pattern.

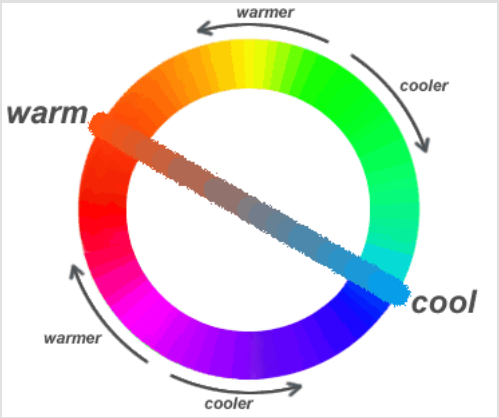


This scan shows the same scan with the moiré minimized.



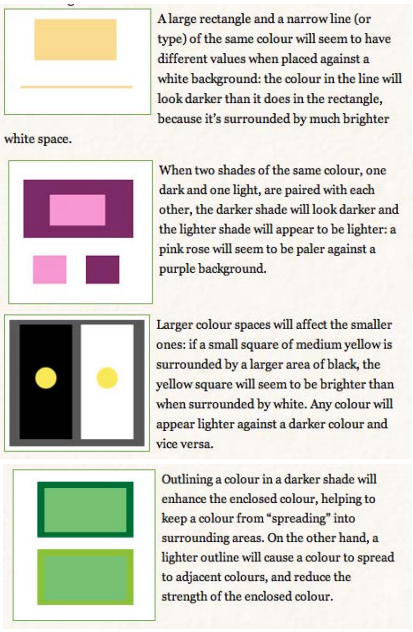
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Colour in Practice



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A large rectangle and a narrow line (or type) of the same colour will seem to have different values when placed against a white background: the colour in the line will look darker than it does in the rectangle, because it's surrounded by much brighter white space.

When two shades of the same colour, one dark and one light, are paired with each other, the darker shade will look darker and the lighter shade will appear to be lighter: a pink rose will seem to be paler against a purple background.

Larger colour spaces will affect the smaller ones: if a small square of medium yellow is surrounded by a larger area of black, the yellow square will seem to be brighter than when surrounded by white. Any colour will appear lighter against a darker colour and vice versa.

Outlining a colour in a darker shade will enhance the enclosed colour, helping to keep a colour from "spreading" into surrounding areas. On the other hand, a lighter outline will cause a colour to spread to adjacent colours, and reduce the strength of the enclosed colour.

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Colour Context



Is the same red used in all background colourtabs?

Is the red tab the same size in each background colour tab?

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Reading Colour



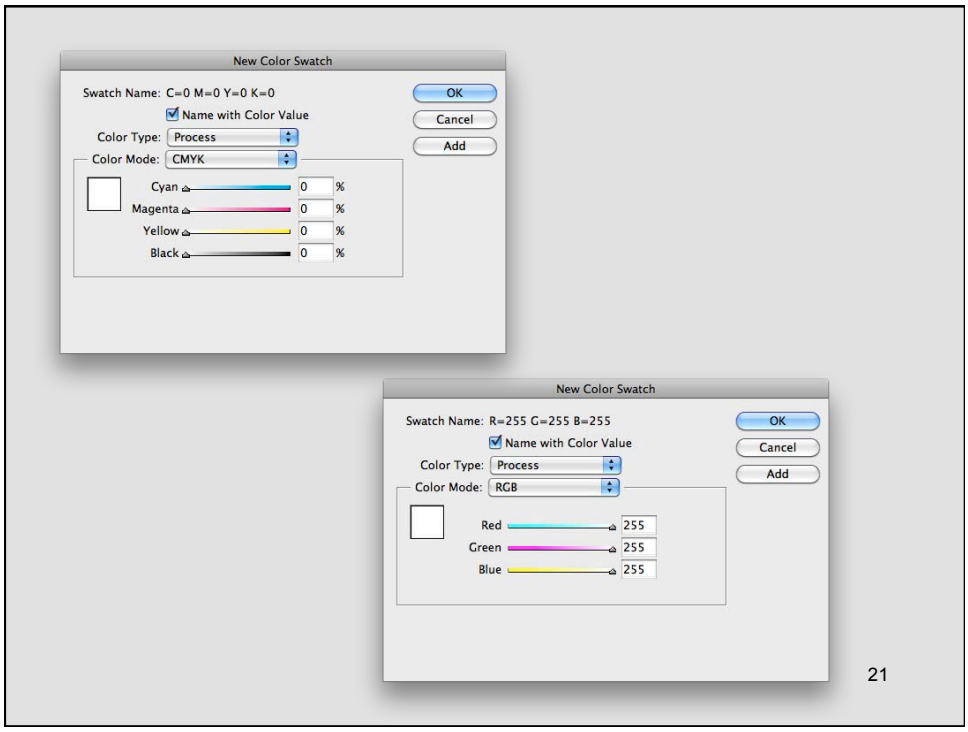
19

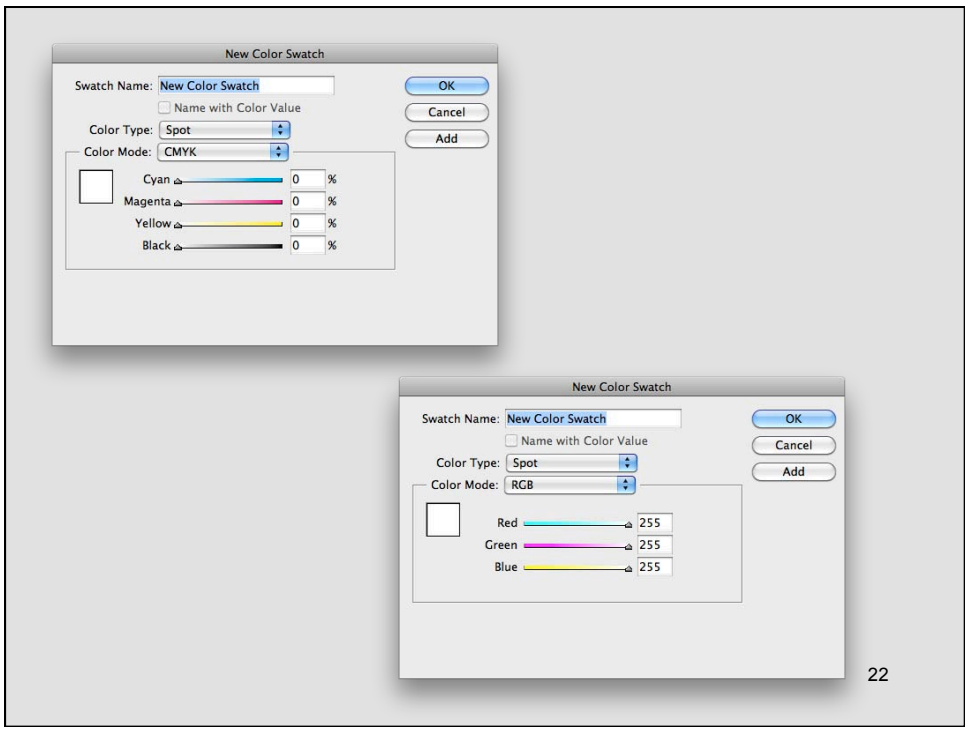
Spot and Process Colour

You can designate colors as either spot or process colour types, which correspond to the two main ink types used in commercial printing.

In the Swatches panel, you can identify the color type of a color using icons that appear next to the name of the colour.

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New Color Swatch
Swatch Name: C=0 M=0 Y=0 K=0
Name with Color Value
Color Type: Process
Color Mode: CMYK
Cyan 0 %
Magenta 0 %
Yellow 0 %
Black 0 %
OK
Cancel
Add
New Color Swatch
Swatch Name: R=255 G=255 B=255
Name with Color Value
Color Type: Process
Color Mode: RGB
Red 255
Green 255
Blue 255
OK
Cancel
Add
21


New Color Swatch
Swatch Name: New Color Swatch
Name with Color Value
Color Type: Spot
Color Mode: CMYK
Cyan 0 %
Magenta 0 %
Yellow 0 %
Black 0 %
OK
Cancel
Add
New Color Swatch
Swatch Name: New Color Swatch
Name with Color Value
Color Type: Spot
Color Mode: RGB
Red 255
Green 255
Blue 255
OK
Cancel
Add
22

Using spot and process colors together

Sometimes it's practical to use process and spot inks in the same job. For example, you might use one spot ink to print the exact color of a company logo on the same pages of an annual report where photographs are reproduced using process color.

You can also use a spot color printing plate to apply a varnish over areas of a process color job.

In both cases, your print job would use a total of five inks —four process inks and one spot ink or varnish.

In InDesign, you can mix process and spot colors together to create mixed ink colors.

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Color Picker

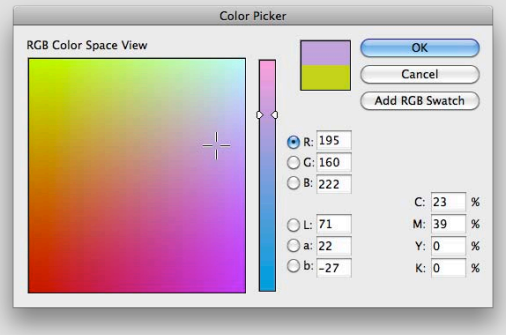
The Color Picker lets you choose colors from a color spectrum or specify colors numerically.

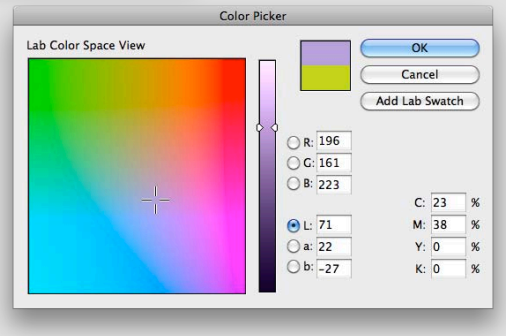
You can define colors using the RGB, Lab, or CMYK color model.

Double-click either the Fill or Stroke box in the Toolbox or the Color panel to open the Color Picker.

To change the color spectrum displayed in the Color Picker, click a letter: R (Red), G (Green), or B (Blue); or L (luminance), a (green-red axis), or b (blue-yellow axis).

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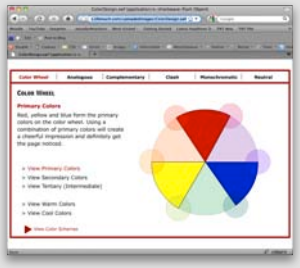




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Defining a Colour Scheme

[Interactive Colour Picker (best opened in Firefox)]



[Hewlett Packard Colour Wheel]



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DIGIT RECOMMENDS Digit 86 (May 2005)

THIS ARTICLE WAS EXTRACTED FROM
The Complete Guide To Colour by Tom Fraser and Adam Banks published by new graphics publishers, ILEX – the digital creative's publisher of choice.

A comprehensive, cutting-edge reference book for a new generation of colour-users, The Complete Guide to Colour brings together key elements of colour theory, practise, and application in one easy-to-use format. From abstract colour theory to the more practical implications of using CMYK and RGB, this authoritative volume may well be the only colour book you'll ever need.

Tom Fraser founded Designer Training Ltd, a firm specialising in professional instruction for design-orientated software. Adam Banks has worked with digital imaging since the early 90s, and contributes regular reviews and tutorials to computer publications.

The Complete Guide to Colour is available at a retail price of £14.99. However, Digit and ILEX have teamed up to save you money.

To order your copy with a 20 per cent discount plus FREE P&P in the UK, visit www.ilex-press.com/digitoffer

PROFESSIONAL DESIGN TECHNIQUES FOR DIGITAL ARTISTS

#11 COLOUR COMPOSITION

DESIGNING WITH COLOUR

There are many conventions governing composition and layout, and all will interact with colour to produce an overall impression. The principles outlined in the following pages are not presented so that you can follow them slavishly – most are too vague for that anyway – but to provide a framework that you can bend and twist to a point where it may be close to snapping.

Perhaps that seems a little melodramatic, but once you get into the swing of designing according to certain rules, whether learned or developed intuitively, it is all too easy to fall into a rut. This is especially true if you are working on a publication or in an environment where style is set rigidly, welded into templates that rarely shift. In such circumstances, it is worth remembering that the smallest changes can lead to exciting results.

One of the benefits of computer-based design – contrary to prejudice – is that the computer has no fixed ideas. When you sketch a layout on a pad, your brain and hand will tend to guide elements into conventional positions. On the monitor, your mouse hand can whiz objects around much more randomly and generate new possibilities. Having produced a happy accident, you can always use your knowledge of conventions to analyze why something looks good and develop it rationally.

Negative space should perhaps be mentioned first. In page layouts, white space radically influences a reader's perception of text and images. Opening up the leading between lines of type or surrounding a block of text with generous margins can allow a page to breathe. In graphics and photos, negative space (not necessarily white) can add drama and influence an interpretation of the visual content. For example, in cropped photos, extra space is conventionally left at the side the subject is facing; cropping the opposite way allows political editors to show a figure with nowhere to go and a dangerously exposed rear.

Right: This 1930s magazine cover provides a classic example of colour composition. Both colour and form are carefully balanced. The vein of the text which is depicted in flat colour fields, provides an opposing diagonal to the figure, shaded three-dimensionally in monochrome. Yellow – a stronger colour than red – is tempered by a larger neighbouring area of blue.

BASICS OF COMPOSITION The way we take in a composition is rooted both in the evolution of our eyes and brains and in our cultural experience of reading texts and looking at pictures. Although it is impossible to predict how random individuals will respond to a given arrangement of elements, some useful rules of thumb are widely accepted.

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The place where the viewer's eye will land first is the 'focal point'. Before we begin influencing the eye with colours and forms, there are certain natural focal points on a page or canvas. One is near the centre, but a little higher, and can be slightly to one side. Others are found in a square surrounding this and can be located either by dividing the canvas into nine equal squares (the 'rule of three' or 'thirds'), or by drawing diagonal lines between the corners of the canvas and bisecting them.

Try placing two or three elements of different sizes and colour values at focal points, or working out from just one focal point. You can use a focal point indirectly or negatively: forms may surround it, or lines may lead the eye to it. Of course, you can ignore the conventional focal points altogether, as long as your composition makes some kind of visual sense. Key elements are often arranged to form a triangle, or within an imaginary circle. All of these principles can be scaled to govern smaller areas within a composition.

When laying out two-dimensional static artwork, we need to remember that our brains evolved to interpret activity in a three-dimensional scene. This has a number of consequences. Because moving objects are of more immediate significance in the real world than still ones, we instinctively look for movement in a scene. Movement can be defined as consecutive sightings of a similar form in different positions. But even simultaneous instances can trigger a sense of movement.

A sequence of shapes scattered across a page can suggest motion, with the assumed direction being left-to-right or top-to-bottom. There is some uncertainty about whether this differs in cultures that do not write text this way. The shapes need not be identical, or even very similar – colour is one of the cues that can encourage us to associate them. If the shapes vary consistently in size, from large to small, there will also be an impression of perspective, with smaller forms receding into the distance.

Lines often serve the functional purpose of dividing an area, but they can also be used to lead the eye. When our attention is attracted by a figure that consists of a line, we tend to follow it, again in the conventional directions. Lines or shapes radiating from a point give the impression of moving towards that point, and draw the eye to it. A similar effect occurs wherever lines cross, while parallel lines reinforce each other. Horizontal lines make the page appear wider and give an impression of calm and expansiveness. Verticals can be elegant and imposing, but they may feel restricting. Diagonal lines appear dynamic.

Left: The photo is more artful than it might seem. The window and the mullions centre on diagonally opposite focal points. Horizontal lines draw the eye outwards: what is through the door? Around the corner?

Below left: Compare this monochromic composition with the focal point diagram opposite, top left. The small highlight on the chair back is essential to the painting.

Below: These diagrams show two ways to fix the conventional focal points within a rectangular composition.

1. Rule of three in horizontal (landscape) format: a photographer's favourite, also suitable for paintings and graphical compositions.

2. Rule of three in vertical (portrait) format: supremely elegant (it's no coincidence that the diagram is reminiscent of a Georgian window), but can feel pinched.

3. Bisected diagonals in portrait format: the focal points move outwards horizontally compared to the rule of three, expanding the composition within the canvas.

4. Bisected diagonals in landscape format: again, feels more expansive than the rule of three, but risks a lack of interest at the centre.

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#11 COLOUR IN COMPOSITION

COMPOSING WITH COLOUR Within a scene, we tend to see relatively large, plain elements as a backdrop to smaller, more distinct ones. The latter catch our attention first and seem closer. This principle is known as 'figure and ground', and is important for several reasons. First, it contradicts the assumption that smaller items will necessarily seem less significant: in fact, they may well dominate. Second, it tells us that a composition in which figure and ground are not immediately distinguishable may seem lifeless and uninvolving. Elements should be differentiated by size and colour.

Third, the principle of figure and ground combines with our knowledge of colour theory to help us understand the impressions created by colour within a composition. Warm hues (in the red part of the colour wheel) tend to advance towards the viewer, while cool (blue) hues recede. Therefore, applying a warm colour to a figure will accentuate its tendency to jump out, and cool colours will encourage a ground to recede; reversing this will tend to negate the effect, giving a more balanced and less striking impression. A small splash of warm colour on a cool background will be more pleasing than the reverse.

It might be assumed that figure elements should also be brighter than grounds, but in fact dark figures against a bright ground are much more acceptable to the human eye. We write in black on a white background, despite having had the technology to do the reverse, because it seems more natural. Changing the value (lightness) of the ground can have a strong effect on an image as a whole, especially in graphical compositions made up of uniform colour fields. Light figures on a dark ground seem to emerge from shadows or darkness, making them seem luminous and often mysterious or foreboding, an effect that was fully exploited in Renaissance painting.

A midtoned background either forces figure colours into a narrower range of values (all lighter or all darker than the ground), resulting in a muted or hazy effect. Or, by allowing some figures to be lighter and others darker than the ground, prevents the composition being interpreted in terms of spatial recession, an effect that is visually disorienting but can be graphically rewarding.

Elements that differ most in value from the background will always draw the eye first, almost regardless of differences in hue. Colours are intensified by being placed on a very dark or very light ground, but their

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temperature and tendency to advance or recede may also be affected: blue on white can advance, while red always advances against black, even in extremely dark shades, as is powerfully demonstrated in the well-known paintings by Mark Rothko.

Repetition, or rhythm, is an important feature of many compositions. The use of colour can contribute to the effects of repeating lines and shapes: graduation of lightness and saturation can tell us which way movement is going, or reinforce the impression of forms fading off into the distance. More distant objects appear lighter, less saturated, and less distinct, an effect that can be created by blurring or 'feathering' elements or reducing the detail with which they are drawn.

Progressive sequences of colour lead the eye and make the composition more dynamic, while repetitive sequences give a sense of order and balance. Closely spaced repetition of hues creates optical mixing, giving the overall effect of a continuously coloured surface. Similarly, exact repetition of lines, shapes or colour fields – pattern – can allow an area to appear uniform even though it may contain a large amount of detail.

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