Colour

Johannes Itten wrote that colours 'have a mystical capacity for spiritual expression without being tied to objects.' In other words, you can make colour the reason for and the subject of a picture.

If you make confident and good use of it, colour can be by far the most powerful element in a photograph. It can be immediately striking or it can be delicate and subtle. You could of course, say the same about many graphic techniques, but colour plays a different role in our perceptions. We respond to colour in a complex way that goes beyond a simple visual response. Colours evoke reactions at an emotional, subjective level.

If colour has been used powerfully in an image and at the same time it strikes a sympathetic chord in the viewer, it can be the very essence of the picture. In this, it differs from other graphic elements. The ways in which you can arrange lines in a photograph may, for instance, create a sensation of movement or stability, but colour can create deeper responses, including some that are not always possible to describe.

Colour works on 3 levels. They are: Visual - this is the objective, immediately obvious level; Expressive - the emotional level, evoking sensations that are often subjective and non-visual; Symbolic - the cultural level, where certain colours and combinations are associated with things that we have been brought up with.

At one level, the idea of mixing colours is an irrelevance in photography. However, this is not to say that only painters can control the colours they use. Photography offers all kinds of opportunity for rearranging the colours of an image: change of viewpoint, different framing, moving the subjects, altering the lighting, and careful choice of filters.
The qualities of colour

Hue

A colour can be defined in terms of its hue, its brilliance and its saturation. Hue is very much the prime quality of a colour, and is what gives the colour its uniqueness. In photography, the 2 main ways in which you can influence a hue are by using a different colour of light (for instance, waiting for the orange cast at sunset instead of the neutral white light from a midday sun) and by using a coloured filter over the lens. In either case, however, it is only possible to change the overall hue, not that of individual objects.

Brilliance

The 2 other qualities, brilliance and saturation, are a matter of degree of a hue. Brilliance is the lightness or darkness of a colour; white and black are the extremes of this scale. It is sometimes a little difficult to distinguish brilliance from saturation, but it may help to remember that, in varieties of brilliance, the colour remains pure and unadulterated.

The actual range of lightness and darkness differs between hues, and this can cause difficulties in matching the brilliance. Yellow can only vary between a medium tone and very light; there is no such thing as a dark pure yellow. Red becomes pink when very light, and so loses its main qualities. Blue, however, covers the full range.

Saturation

Saturation is a variation in the purity of a colour. At one end of the scale are the pure, intense colours of the colour circle. As they become less saturated, they become more grey, less 'colourful', and dirtier. Colours become unsaturated when they are mixed with white, black, grey or their opposite colours on the colour circle.

Primary colours

Yellow

Yellow, the brightest and lightest of all colours, does not exist in a dark form unless it is degraded; the darkest pure yellow is still brilliant compared with all other colours. As it is usually found against darker tones, yellow often seems to radiate light in a picture. Matching its brilliance with other colours is difficult: a similar blue, for example, would have to be quite pale. There is very little latitude in yellow: to be pure it must be an exact hue, while even a hint of yellow-green is obvious. Yellow (and every other colour) expands, contracts and changes when seen against other colours. It is most intense against black, and most insipid against white. When it is seen against violet and blue it is strong.

Expressively, yellow is vigorous and sharp, the opposite of placid and restful.
Blue

Blue recedes visually, being much quieter and less active than red. Of the 3 primaries, it is the darkest colour, and it has the greatest strength when deep. It has a transparency that contrasts with red’s opacity.

Identifying a pure, exact blue, is less easy than identifying red or yellow, particularly if there are no other varieties of blue adjacent for comparison.

Expressively blue is, above all, cool. Blue has associations of intangibility and passivity. It suggests a withdrawn, reflective mood.

Red

In complete contrast to the restrained qualities of blue, red is visually one of the most insistent, powerful colours, and immediately attracts attention. When set against cooler colours, green in particular, red advances towards the viewer. It has considerable kinetic energy.

In contrast to the transparency and luminosity of yellow, red is relatively dense and solid.

Secondary colours

Orange

Orange is the mixture of yellow and red and absorbs some of the qualities of both. It is brilliant and powerful when pure and, since yellow radiates light and red radiates energy, it is a colour very much associated with radiation. When lighter, tending towards beige, or darker, tending towards brown, it has a neutral warmth.

Violet

This mixture of red and blue stands out as being the most elusive of colours. Many people have great difficulty in distinguishing pure violet, a difficulty further compounded in photography by the problems of recording it (dye response in some films and papers is particularly unsuccessful). Pure violet is the darkest colour. When lighter it becomes lavender, when dark can be confused with dark blue and if reddish tends towards purple and magenta. It has rich and sumptuous associations but can also create an impression of mystery and immensity.

Green

Green has the widest range of distinguishable effects. Although of medium brightness, it is the most visible of colours to the human eye. Green is the colour of growth, yellow-green has spring-like associations with youth.
Broken colours

In traditional colour theory, pure colours have dominance and so painters are trained to construct hues from the primaries and secondaries. Photography, by contrast, deals almost exclusively with the colours found in the real world where pure colours are not particularly common. Most found colours are broken: that is they are seen as a mixture of hues that gives a deadened, unsaturated effect.

Subtle palette

Such colours are, however, very rewarding to work with because of their great variety of subtle effects. The differences between broken colours are much narrower and so working with them trains the eye to be delicate in its discrimination and to prize rare colours.

Natural colours

Russet, sienna, olive green, slate blue and an almost limitless variety of others, including the chromatic greys, make up the basic palette of photography and allow us give a visual unity to sets of images based around a common theme.

Interference colours

A special assembly of colours exist through a naturally occurring phenomenon known as interference. Interference effects are seen when a material slows some of the light rays passing through it or reflecting off it, and when these interact with other rays to create a play of colours. Interference colours are produced by a variety of substances, including oil slicks, ordinary soap bubbles, pearl and mother-of-pearl.

Black-and-white

Although they lack all hue, the 3 neutral shades of black, white and grey are essential components of colour photography. Not only do they exist as counterparts and settings for the colours just described, but they are mixed with these pure hues in varying degrees to make adulterated browns, slates and other subdued colours.

Black

In photography, black is produced as the maximum density on film and paper: D-max as it is known. Black can never be too dense. Over-exposure, fogging, or altered processing will create a weakness in the D-max.

White

White is the absence of any tone whatsoever: clear film in a transparency or underexposed printing paper (negative/positive). Photographically, white needs care in exposure. Slight underexposure makes it appear muddy; slight overexposure destroys the hint of detail and usually gives a washed-out effect.
**Blending colours**

It is not quite enough to say that certain pairs and combinations of colours are harmonious. Each colour has an intrinsic brightness, so complete balance requires that the combinations are seen in certain proportions. In photography, this is complicated by the details of texture, shape, and so on. The colour in photographs is enmeshed in the structure of the subject.

**Basic colour combinations**

As a start, however, we can look at the basic combinations of primaries and secondaries. The complementary for each primary colour is a secondary: red/green, orange/blue, yellow/violet. However, we have already seen something of the differences in brightness among these 6 colours. In descending order, the generally accepted light values, determined by Goethe, the German poet, playwright and amateur scientist are yellow 9, orange 8, red and green 6, blue 4 and violet 3. The brightness or darkness of the hue also affects these values.

**Intuitive use of colour**

Although exact harmonious proportions could be worked out for any colour image, if you want to create harmony in a photograph, intuitive judgement of the balance of colours is sufficient; it is the only method which allows an imaginative approach. The principles of harmony should not be neglected, but are for preparation only.

**Red / green harmony**

Pure red and green have the same luminosity, and so combine harmoniously in equal proportions. This, however, presupposes that both colours are pure and exact, and this rarely happens.

Red and green, with their same luminosity, produce a special colour effect known as vibration. The edge between the 2 colours seems to be optically unstable; if you stare at it for long enough you can see a light and dark fringe. This optical vibration makes pure red/green combinations unsettling to look at for long, and even irritating. Nevertheless, the effect is eye-catching and dynamic.

As you might expect, changing the proportions weakens the harmony. However, when the balance is extreme, the smaller colour acquires extra energy.

**Blue / orange**

Orange is twice as luminous as blue, so that the best balance is when the blue is twice the area in a picture. Compared with red/green combinations, this makes for less optical confusion about which colour is the background. It also drastically reduces the vibration, so that orange and blue are generally more comfortable to look at.
Yellow / violet

This third complementary pair combines the brightest and darkest of all the pure hues. As a result, the contrast is extreme and the balanced proportions need to be 1:3, with the yellow occupying only about a quarter of the image. At these proportions, the yellow is almost a spot of colour, and the sense of a relationship between the 2 is correspondingly weak.

Multi-colour combinations

While red/yellow/blue is the most powerful mixture of pure hues, other combinations of unbalanced colours can have similarly impressive effects. Pure hues fight intensely for attention, and the strongest combinations are those of 3 colours. Even a fourth introduces excess competition, so that instead of building each other up, the colours dissipate the contrast.

Wherever you can find groups of pure colours, they make easy, attention-grabbing shots. Being unbalanced in their positions around the colour circle, they do not mix to grey in the visual cortex, and so contain the element of tension missing from the examples of primary and secondary mixes on these pages. Considered as part of an overall programme of shooting, strong colour combinations are the short-term, straight-between-the-eyes images. They fit well into a selection of less intense pictures as strong punctuation, but several together quickly becomes a surfeit.

Soft colours

Diminishing the range of colour intensity has the interesting effect of refining the eye's discrimination. The differences in hue between unsaturated colours are less obvious than with fully saturated colours, and the eye pays more attention in assessing the differences and relationships. The precise colours are usually inherently more interesting because they are less familiar.

Colour contrast

The colour circle can be divided in half, between cold and warm. The centres of the 2 half-circles are blue-green and orange-red respectively. These 2 poles always have temperature associations, but the colours on either side depend on context for the strength of their effect. Green, for instance, may appear cool if contrasted with a distinctly warm colour like orange, but will not generate this impression if combined with yellow-orange.
Distance

Cool colours recede, warm colours advance; blue-green and its neighbouring colours are associated with backgrounds and distance. If the colour of a subject is warm, and that of its background cool, the impression of depth will be heightened. This is a different depth sensation from the one created by light/dark contrast, but if the 2 are combined (a pure orange against a deep blue, for example), the impression is slightly stronger. As a result, a small area of a warm colour set in a larger cool-coloured frame always looks appropriate.

Coolness and warmth

Cool colours suggest transparency and airiness, in part by association with the blue of the sky or of an atmospheric haze. The opposites for warm colours, opacity and earthiness, are not such strong associations, but exist by virtue of the contrast. Also, cool colours, blue-green in particular, suggest wetness - a natural association with water - while orange-red and similar hues suggest a dryness from the effects of heat.