

LIGHT Education

The art of colour

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The world of colours.

Colour is the sensation caused by the light that hits the retina of the eye. Let us try the following experiment: if you make a beam of white light pass through a glass prism you will see that the light will be decomposed in an array of colours that constitute the solar spectrum, i.e. the colours of the iris. Every surface absorbs light and reflects only part of it. Starting with the three fundamental colours, also called primary colours, it is possible to combine any tint. The colours obtained by mixing two primary colours are defined secondary, if secondary colours are mixed with primary ones tertiary colours are obtained. The colours of the iris and all the shades of the spectrum are pure colours because they do not contain either white or black.

Primary colours

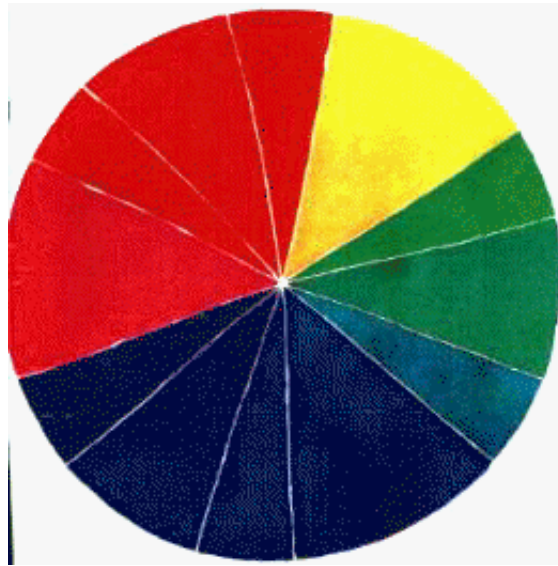


Yellow, blue and red are primary colours, so called because they cannot be obtained by mixing other colours. In theory, by combining these colours we can obtain all the other colours and in every shade. Such an operation, however, is laborious, therefore it is easier to start with some more colours, by using those we have already prepared.

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Newton's disc

This chromatic disc can be useful to understand the relationship between primary and secondary colours.



The English physicist and mathematician Isaac Newton proved with an experiment that when a thin beam of white light passes through a triangular glass prism, it is decomposed and produces the range of colours of the rainbow. This experiment derives from the so called Newton's disc which presents primary and secondary colours arranged so as to go from one primary colour to the other through all the different combinations that can be obtained with them. The position of the colours on the disc shows if these colours are harmoniously assorted (if they fade into each other) or if they are in contrast (diametrically opposed).

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Complementary colours



The colours on the opposite position on the disc are called complementary colours and are: orange and blue, yellow and violet, red and green. Each pair offers the maximum obtainable contrast because each colour does not contain any trace of the other. For those who would like to paint on silk, this point of the chromatic theory is extremely useful. Complementary colour combinations are much more interesting than those obtained with harmonic colours and can create really incredible effects. The important thing is to make sure that the colours are used in the right proportions. If we distribute the same quantity of complementary colours the effect will be unpleasantly clashing, if, on the contrary, we use a bigger quantity of one colour and a smaller quantity of its complementary, the former will be emphasized. For instance a red geranium on a background of green leaves is the most vivid and brilliant effect you can obtain.

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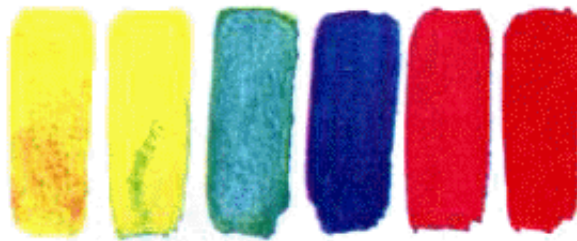
Secondary colours



Secondary colours are those obtained by mixing two primary colours: yellow and red give orange; yellow and blue give green; blue and red give violet. Physics researching light rays, however, consider green a primary colour. Primary and secondary colours are the main components of the solar spectrum.

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Tertiary colours



Tertiary colours are a mix of primary and secondary colours: yellow-green, blue-green, blue-violet, yellow-orange, red-orange. Red, yellow, orange are called warm colours; blue, green, violet are cold colours.

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Warm and cold colours



Colours have a psychological effect; on this basis and by convention we distinguish between warm and cold colours. By basically halving the chromatic disc with a straight line which connects yellow with violet, we will have on one side those colours that are considered warm, i.e. all reds, yellows and their combinations; and on the other side those colours that are considered cold, i.e. greens and blues up to indigo.

Warm colours are showy and generally tend to prevail on the others, cold colours on the contrary tend to merge and to give the idea that they are shaded, For instance if you bring a bright red next to a green one, you will notice that the red one will be extremely evident while the green one will suggest depth. To use warm and cold colours together and obtain a good result it will be necessary to take these characteristics into consideration: this means that the two groups must be well balanced. Beautiful effects are also obtained by using exclusively and separately warm and cold colours.

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Discordants colours



The chromatic disc is extremely useful not only because it allows to choose harmonious colours, but also because it indicates the possibility of different and more original combinations. Our eye is prepared to see colours in the logical succession that the disc presents, for instance it is normal for it to go from red to orange, but it would not have the same reaction in front of a pink and orange matching. The same discordance occurs when the logical order of values of complementary colours is subverted; for instance we expect violet to be darker than yellow and their matching can work well and look pleasant; if, however, orange is matched with light blue instead of dark blue the effect is certainly unpleasant. Nonetheless, even when discordant colours are used naturally and in the right proportion, it is possible to obtain very interesting and original chromatic combinations.

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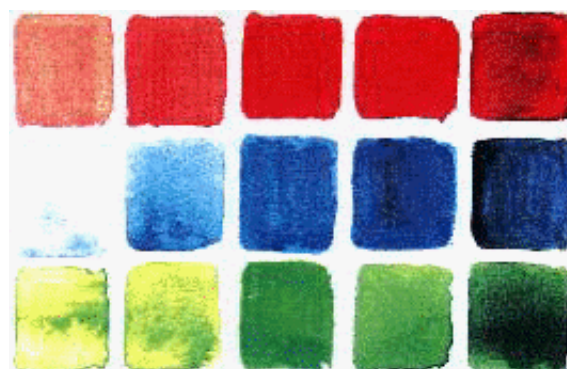
Values



Each colour can have a wide range of values. A value corresponds to the place that a chroma occupies on a scale of greys, from very light to almost black. In order to establish the value of a colour, imagine that you photograph it in white and black: it will appear as a shade of grey and the nearer this will be to white the more the value will have to be considered light. Two colours are defined as having the same value when they are equally dark or light. To give depth to a drawing and to make it interesting, the right balance of values must be taken into consideration.

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Shades

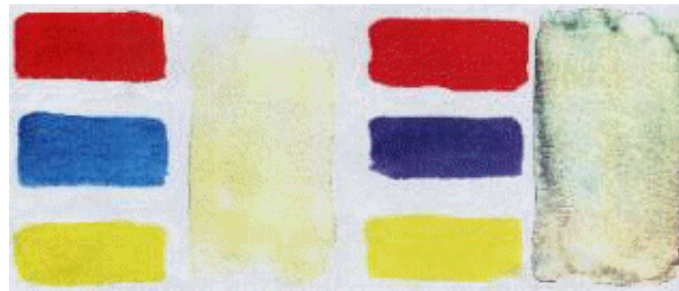


Shades are gradual variations of the intensity of the same colour. All colours of the

chromatic disc can be made darker or lighter by adding, respectively, black or white; for instance, red mixed with growing quantities of white will gradually shade into light pink; with the same procedure, but by adding black, it will be possible to shade it into brown.

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Neutrals colours



Neuter colours are much used, both alone or to make a brilliant colour stand out. The neuter colours, which include grey, beige and some browns, can be mixed to all primary and secondary colours. Grey is a much used colour and can be obtained in various ways, the simplest one is by mixing white and black.

Another way is to mix the three primary colours, yellow, red and blue; the greys shown above are an example. This mix, moreover, enables the creation of greys with a very light primary hue. This is obtained by regulating the proportions of the primary colours mixed together: if yellow predominates, we obtain a yellowish grey; if red predominates, the grey is slightly pinkish; with blue the grey obtained has a blue-tinted shade. A wise use of these mixes enables the creation of beautiful monochrome patterns in which it is possible to play on all variations of grey.

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