

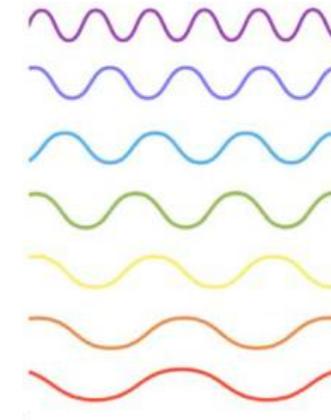
AN INQUIRY INTO THE PERCEPTION OF COLOUR

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PERCEPTION  
OF  
COLOUR

An interactive exhibition exploring how we see colour and our unique perceptions of how it effects the world around us.

Please refer to this booklet as you make your way around the exhibition. It will provide you with information and interactive activities which will contribute to further research on the subject.

All words highlighted in colour are defined in the glossary at the back of the guide.



You will see wavelengths on the floor of the exhibition- this guide will prompt you which to follow when you make your way through each exhibit.



Colours are a result of **electromagnetic radiation**\*. They are characterised by their frequency and intensity. Red has the longest wavelength and shortest frequency. Violet has the shortest wavelength and the highest frequency.



Objects do not inherently possess colour. Surfaces of objects absorb some colours and reflect others- the reflected wavelengths are the colours we perceive. An object appears white when it reflects all wavelengths and black when it absorbs the all.



Light enters the eye and reaches the **retina**\*, which is covered by millions of light-sensitive cells, which are referred to as **rods and cones**\*.



Rods and cones are **photoreceptors**\*. Rods decipher vision at low light levels. Cones are active at higher light levels, and are responsible for perceiving colour.

There are three types of cones:

- S-cones  
Detect blue light frequencies/ shorter wavelengths.
- M-cones  
Detect green light frequencies/ medium wavelengths.
- L-cones  
Detect red light frequencies/ longer wavelengths.

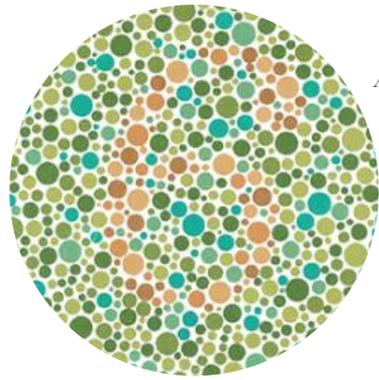
*Note: Cones are named after the colour they are most sensitive to, however can still detect other colours close to that wavelength.*

Humans need all three of these cones to see in full colour (**Trichromatic**\* vision) as the integration of the use of cones allows us to see the millions of colours on the **visible spectrum**\*. Those lacking cones have **colour vision deficiency**\* of varying severity (see Colourblindness).



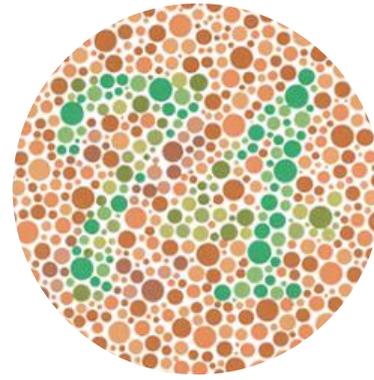
Light information from the rods and cones are then sent to the **optic nerve**\* which is then transported to the **primary visual cortex**\* of the brain. The information is then processed and interpreted into an image.

# COLOUR BLINDNESSES

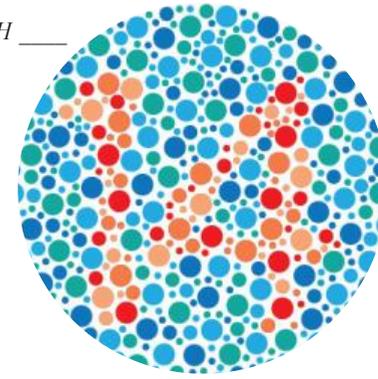


A \_\_\_

What numbers do you see?

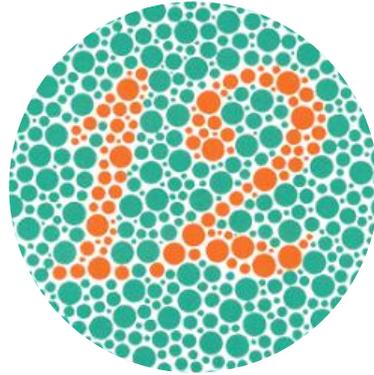


E \_\_\_

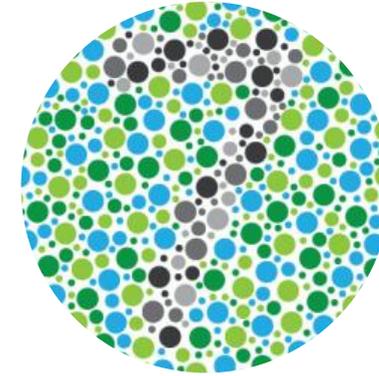
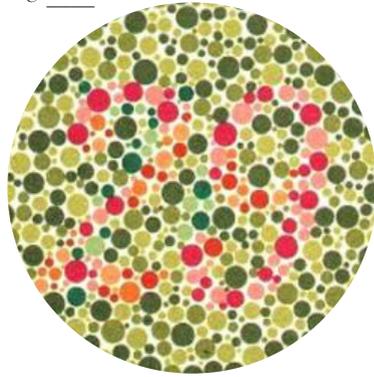


H \_\_\_

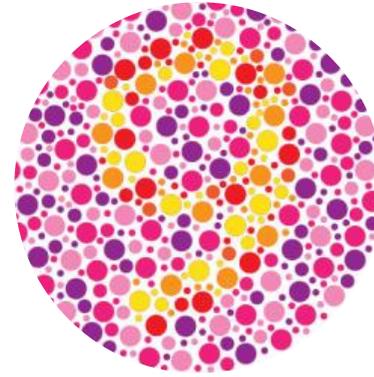
B \_\_\_



C \_\_\_

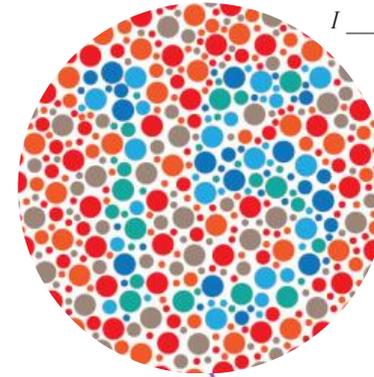
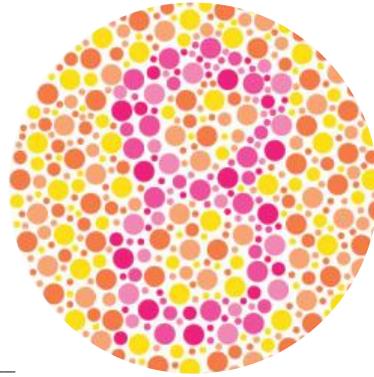


F \_\_\_



G \_\_\_

D \_\_\_



I \_\_\_

ANSWERS:  
A-6, B-12, C-29, D-8, E-74, F-2, G-9, H-14, I-15

Tests sourced from:  
[www.enchroma.com/pages/about-us](http://www.enchroma.com/pages/about-us)

For more information on colourblindness,  
visit their website.





# COLOUR SCHEMES

Everyday we come across combinations of colours which are purposefully used to have a psychological effect on you. Have you ever wondered why some colours work well together and others do not? Various colour schemes work alongside the colour wheel to have harmonious or jarring effects.

### *Complementary:*

Combines colours from the opposite sides of the colour wheel. This created a vibrant and energetic look.

### *Analogous:*

Made using three colours which are next to each other on the colour wheel. These are harmonious and pleasing to the eye as they are often seen in nature.

### *Monochromatic:*

Made using different tones, shades, and tints within a specific hue. This prevents colours clashing and generally creates visual cohesion.

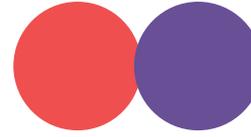
### *Triadic:*

Comprised of three colours evenly spaced on the colour wheel, this enhances contrast whilst also being uplifting and vibrant. However to use this successfully the colours have to be well balanced; with onecolour dominating and the other two being used as accents.

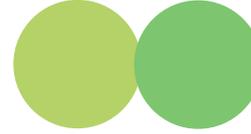
### *Discordant:*

Colour combinations that contrast and clash, rather than harmonise. This colour scheme is more dynamic and is often used to boldly draw attention to something specific.

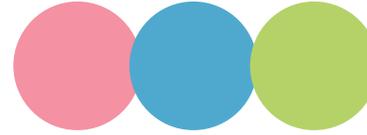
Can you identify these colour schemes?



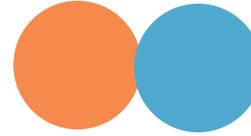
A \_\_\_\_\_



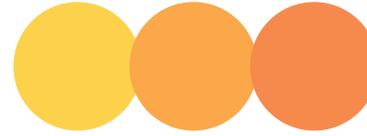
B \_\_\_\_\_



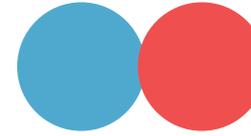
C \_\_\_\_\_



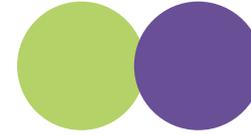
D \_\_\_\_\_



E \_\_\_\_\_



F \_\_\_\_\_



G \_\_\_\_\_

Colour preferences are deeply rooted responses influenced by experiences and association. The more experience-based feedback a person receives about a colour influences whether it is perceived positively or negatively. For example, if you associate a blue sky with positive experiences, you are more likely to enjoy that colour. Our favourite colours often have positive connotations to us as individuals, however, whether a perception is positive or negative differs from person to person.

Think about your favourite colour.. What does it remind you of? Do you know why its your favourite colour?

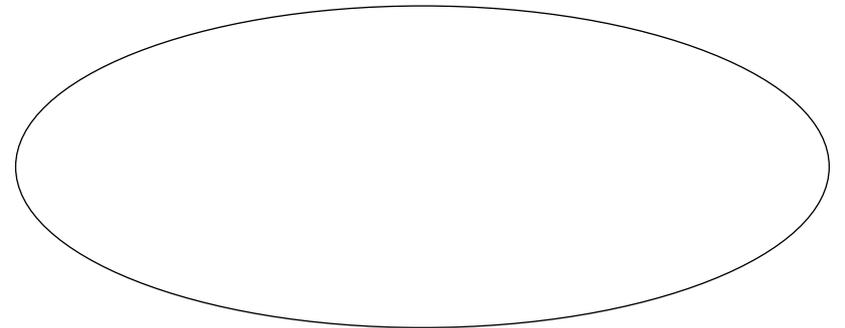
Fill in the leaflet provided then mix the described colour and paint it on the cover. Take a look at other people's responses then add yours to the wall. Can you see similar colours? Do many people share your favourite colour? Do their connotations differ from yours?

## WORLD'S FAVOURITE COLOUR

The largest ever survey about colour was a collaboration between Made Thought and GF Smith Paper. They set out on an ambitious search to find the World's favourite colour. [Worldsfavouritecolour.com](http://Worldsfavouritecolour.com) was a website which the survey took place on. "The project was inclusive and personal, and the outcome was to that the chosen colour would become part of the iconic Colorplan paper range." The world's favourite colour is:



What are your thoughts on this colour? Do you like it? How does it make you feel? Are you surprised this is the world's favourite colour? Write your thoughts on this sticker then stick it on the exhibit wall.



# GLOSSARY

## *Analogue/ analogous:*

Colour scheme made of three colours which are next to each other on the colour wheel.

## *Associative:*

A colour with a character, idea, or symbol.

## *Chroma Level:*

The 'colourfulness' of an object relative to the brightness of a white object similarly illuminated.

## *Clashes:*

Two colors of equal intensity, which cause visual discomfort.

## *Colour Vision Deficiency:*

A number of different problems people have with their color vision, which means their perception of colors is different from what most of us see.

## *Colour Wheel:*

Arranges the 12 colors of the spectrum in a circle

## *Complementary:*

Combining colours from opposite sides of the colour wheel.

## *CMYK:*

A subtractive color model used in color printing. CMYK refers to the four inks used in some color printing: cyan, magenta, yellow, and black (key).

## *Dichromacy/ dichromatic:*

Having or exhibiting two colors.

## *Discordant:*

Opposite each other on a colour wheel.

## *Electromagnetic Radiation:*

The waves of the electromagnetic field, propagating through space, carrying electromagnetic radiant energy

## *Greyscale:*

A full range of values from white to black simplified into a graduated scale.

## *Harmony:*

A combination of colors that lets the eye travel smoothly between them with no sharp contrasts

## *Hue:*

The pure spectrum colours.

## *Intensity:*

intensity is the strength/brightness or weakness/dullness of a color.

## *Intermediate:*

When a primary color is mixed with an adjacent secondary color.

## *Luminosity:*

Color's inherent light; lighter colors are more luminous than darker colors, but a lighter color is not necessarily more pure or saturated.

## *Mass tones:*

The predominant hue you see when you look at any color, disregarding any subtle nuances/ undertones.

## *Metamerism:*

When two colors appear the same under certain lighting conditions but different under other lighting conditions.  
*Monochrome/ monochromatic:* Different tones, shades and tints within a specific hue.

## *Optic Nerve:*

The optic nerve is located in the back of the eye. It's job of the optic nerve is to transfer visual information from the retina to the vision centers of the brain via electrical impulses.

## *Overtone:*

Warmth or coolness as associated with warm or cool things.

## *Primary Visual Cortex:*

A part of the brain responsible for highly specialized for processing information about static and moving objects.

## *Protanomaly/ protomat:*

Deficient color vision in which an abnormally large proportion of red is required to match the spectrum.

## *Retina:*

A layer at the back of the eyeball that contains cells sensitive to light, which trigger nerve impulses that pass via the optic nerve to the brain, where a visual image is formed.

## *RGB Colour Model:*

Additive color model in which red, green, and blue waves of light are added together to reproduce an array of colors.

## *Rods and Cones:*

Rods are responsible for vision at low light levels. They do not mediate color vision, and have a low spatial acuity. Cones are active at higher light levels, are capable of color vision.

## *Saturation:*

The intensity of a colour.

## *Shade:*

Deep or dark colours.

## *Synesthesia:*

A perceptual condition in which there is an involuntary blending of one or more senses.

## *Tint:*

Lighter colours that have white added.

## *Tone:*

The lightness/ darkness of a colour.

## *Transitional:*

A shade used to adjust one shade to another.

## *Triadic:*

Comprised of three colours evenly spaced on the colour wheel.

## *Trichromacy/ trichomat:*

Normal color vision requiring that three primary colors be mixed in order to match the perceived spectrum.

## *Tritanomaly:*

A type of partial color blindness due to a deficiency of blue-sensitive retinal cones.

## *Undertone:*

How the colour has been created and whether or not it has a warm (usually yellow) or cool (usually blue) base when creating the colour.

## *Visible Spectrum:*

The portion of the electromagnetic spectrum that is visible to the human eye.

## *Wavelength:*

Light is measured by its wavelength (in nanometers) or frequency (in hertz). One wavelength. equals the distance between two successive wave crests.

