

## Designing with color:

### Objectives:

1. Define color terminology using visual examples.
2. Identify key color systems and describe their relevance to graphic arts.
3. Reveal strategies for choosing color schemes.
4. Explain how color is perceived and processed by the eye and the brain.

Color in visual communication is very complex and has been greatly researched.

### Color perception:

1. How the retina works: Retina – the light sensitive surface lining on the back of the eye. Can be compared to film in a movie camera. W/in the tissue of the retina are receptors referred to as rods and cones. Rods detect lightness and darkness or tones and cones detect color sensations or hues. Thus in Photoshop Hue and Saturations.

### Additive Color:

The additive system makes all color visible. It is the color system of white light. Issac Newton was the first person to study light. 1666 performed an experiment using a prism and a ray of light to discover the additive color system.

He discovered that white light is composed of a blend of red, green, and blue primary hues. If you mix any of the 2 you get a secondary hue: EX: blue and green=Cyan the complement of red. Blue + Red = magenta the compliment of green. Red + Green = Yellow the compliment of blue.

The secondary hues in the additive system are Cyan, Magenta Yellow.

### Subtractive Color:

Based on mixing pigments. As colors are mixed they render a subtracting effect which essentially filters the light striking its surface. When 2 colors are mixed a new color is created because the mixing has changed its wavelength. (Wavelengths are a form of energy that makes up the visible spectrum. Wavelengths determine a color's intensity)

The additive and subtractive are interdependent. The secondary hues of the additive are the primary hues of the subtractive. Cyan (blue), Magenta (Red), and yellow are the subtractive primaries. In color printing Cyan, magenta and yellow are referred to as PROCESS PRIMARY COLORS.

### Color Wheel:

Johan Wolfgang von Goethe is responsible for developing the first color wheel using blue, red, and yellow as primary and purple, green and orange as secondary hues. The model is valuable for understanding color relationships. But the theory on which it is based does not always translate into practice. In Goethe's for example when Blue, Red and Yellow are mixed together is supposed to get Black but in reality you get a grayish-brown color.

The secondary hues of mixing pigments are purple, green and orange, the purple, green and orange yet get depend on the parent hues used to mix them

Hues formed between primary and secondary are called **TERTIARY**. Red-purple, Yellow-Orange and Blue-Green. In addition to Tertiary intermediate hues can be made by mixing secondary and tertiary hues to achieve theoretically all the colors of the spectrum. Any 2 primary hues and the colors between them are called Analogous hues. All primary, secondary, tertiary and intermediate hues are fully saturated pure color – they are pure in the sense that they contain no White, Black or Gray.

### **Specification Systems:**

Choosing the right color or color scheme is process. There are a variety of specification systems that designers use. We will discuss printing color systems. Printing is based on two types of color systems, CMYK and match systems. CMYK – Cyan, Magenta, Yellow, Black. K stands for Key is used for black and is a way to distinguish it from blue. CMYK is referred to as process or four-color process. Digital or conventional reflective art is prepared by breaking down or separating it into each of the 4 colors. The sep. process filters the C,M,Y,K one at a time.

**Match Systems** – Used when the color is solid and isolated w/in shapes or backgrounds. PANTONE MATCHING SYSTEM (PMS) - The color numbering system that is the worldwide industry standard. Other systems include: TRUMATCH, TOYO and FOCOLTONE.

Colors often differ on the screen from when they are printed. This is b/c they differ in the way they are viewed.

***REVIEW: CMYK and match systems used for printing. Both systems are available in digital software and in printed swatch books for specifying color.***

Color used for multimedia or Web design requires RGB system. RGB is the primary hue system of light. Any media venue that relies of projected lights such as photography, DVD, computer and TV monitors depend on RGB, Each hue (RGB) can be adjusted in 1-point increments of brightness from 0 to 255. B/C there is not a translation of color from digital light to printed ink what is seen on the screen is usually NOT what you get.

### **COLOR TERMINOLOGY:**

**Hue** = color

**Saturation** = purity of color

**Chroma** = the amount of colorant present in a pigment. (The more colorant, the more saturated the hue).

**Value** = Lightness or darkness. (Can exist w/out color in grays, black and white but it is also present in colors)

**Tint** = adding white to a pure hue.

**Shade** = the mix of black with a color.

**Tones** = grays also known as midtones.

**Monochromatic** = a single color mixed with tints, shades or tones.

**Project:**

Using one or more of the photos that are already scanned practice converting from RGB to CMYK to Duotone and manipulating the colors using the slider controls.