

## **Week One: The Nature of Color Study Notes:**

**Additive System** - The system of color that uses light. When all the light primaries are combined, the result is white light.

**Color** - A wavelength of light received by our eye that causes a color sensation to be produced in our brain. The word color also means any color derived from any hue; for example, violet is a hue and light violet is a color. A color is not necessarily chromatically pure, and a hue is

**Color Constancy** - Refers to our ability to recognize a color, aside from its lighting conditions giving a color a stable, fixed appearance.

**Color Physics** - The science of color, particularly the science of light and color perception. Color is defined as a visual sensation caused by the components of light either transmitted or reflected to the receptors in our eye.

**Cone Cells** - Are at the heart of our color perception; they selectively respond to specific colors. There are three types of cones: L red (long wavelength) cones, M green (medium wavelength) cones, and S blue (short wavelength) cones.

**Electromagnetic Spectrum** - Energy waves produced by the oscillation of an electrical charge. Electromagnetic waves do not need any material for transmission; that is, they can be transmitted in a vacuum. Light is part of this spectrum.

**Local Color** - Is the general color of an object under normal lighting (daylight or white light) conditions, the identifying color of the object.

**Medial Primary Colors** - Red, green, blue, and yellow—a combined group of both the subtractive and additive primaries also called the psychological primaries.

**Primary Colors** - Hues that are not obtainable by any other color mixtures.

**Process Colors** - The four primary colors used for commercial printing and color photography: cyan, magenta and yellow, also abbreviated as CMY. Cyan, magenta, and yellow are close to the traditional subtractive primary hues of red, yellow, and blue.

**RGB** - Red, green, and blue are the additive primaries of light. RGB also is a color mode used by both the computer monitor and scanner. RYB Red, yellow and blue are the subtractive primaries of pigments and dyes.

**Rod Cells** - Are cells that help us perceive light/dark (value) differences and lighting strength, particularly in dim lighting situations.

**Secondary Hues** - The halfway points between the primary hues; for example, a mixture of red with blue will yield violet (red + blue = violet). Violet is a secondary hue.

**Subtractive System** - In our perception of surface color, some light waves are subtracted, resulting in a reduction of the amount of light reflected to our eye. The subtractive color system is also in use with physical colors such as pigments and dyes, which lose intensity as they are mixed.

**Tertiary Hues** - Those hues produced by the mixtures of a primary and a secondary: RO, RV, YO, YG, BG, BV.

**Trichromatic Theory** - proved that all colors were generated from the three spectral hues of red, green, and blue.

**Visible Light Spectrum** - A small part of the electromagnetic spectrum that we can actually see.

**Wavelengths of Light** - Each hue in the visible spectrum has a corresponding wavelength measured in nanometers, which are only one billionth of a meter. Hue differences are tiny measurement differences between the crests of each wavelength. Red has the longest wavelength and violet the shortest.