

Properties of Color

Whether using the additive or subtractive primaries, each color must be described in term of its Physical properties. Their properties are independent of each other, and each one must be measure of defined in order to fully describe the color. **Color properties** allow us to distinguish and define colors. The more we know about color properties, the better we can adjust colors to our needs.

Three properties of color

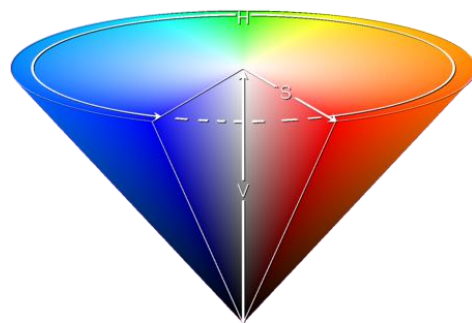
HSB stand for hue, saturation and brightness

Hue is the common name of a color; red, orange, green, purple

- Hue is determined by specific wavelength of the color in the ray of light.
- Hue describes the visual sensation of the different parts of the color **spectrum**.

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

- Hue ranges from 0° to 359° when measured in degrees.

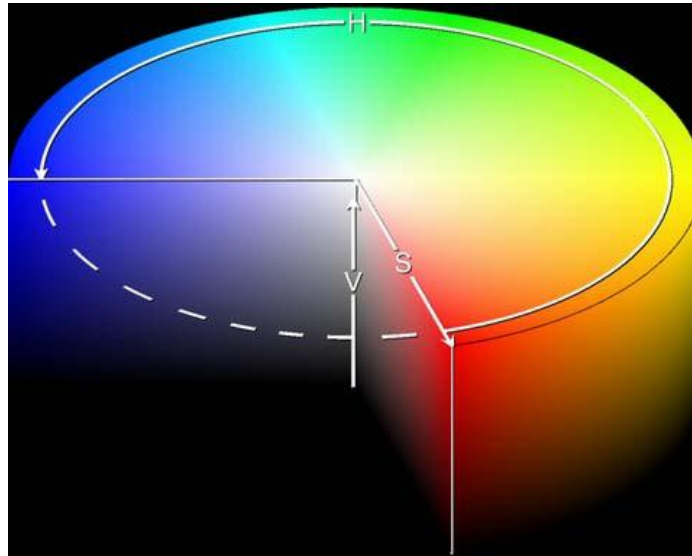


The spectrum of colors is created by passing white light through a prism.

One hue can be varied to produce many colors. **Pink, rose, crimson, maroon** and **scarlet** are all colors, but the **hue** in each case is **red**.

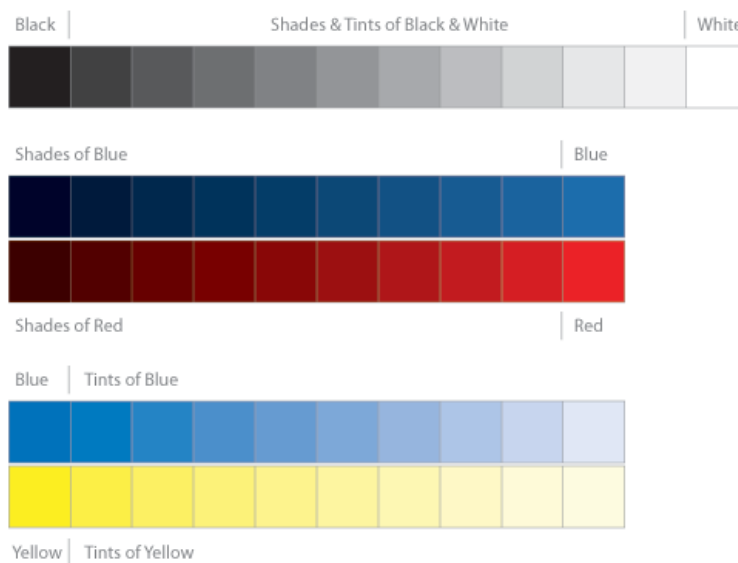
Saturation refers to the intensity, purity or chroma – the absence or black, white or gray – in color.

- is a measure of the richness of a color.
- A vivid color has high or full saturate, whereas a dull one is desaturated.



Brightness, or value, is the lightness or darkness of the hue.

- The brightness of color is changed by mixing it with white (to form a **tint**) or black (to form a **shade**) in varying proportions



Changing Color Values

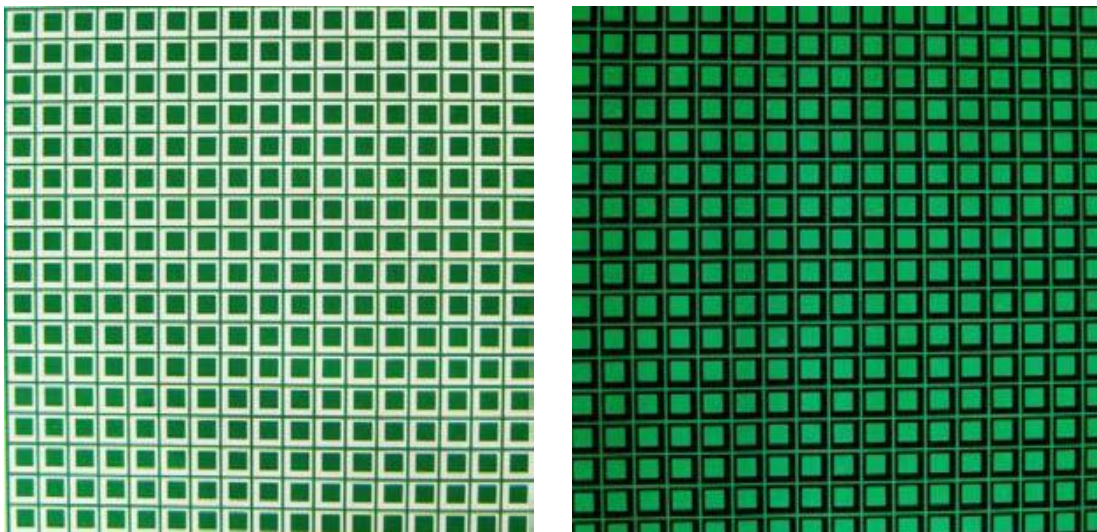
- When working with paint and pigments, the value of color can be altered by thinning the color with medium.
- The more transparent color will be lighter value when applied over white background.
- The value of color can be altered by mixture of other hues for instance violet will darken a yellow.



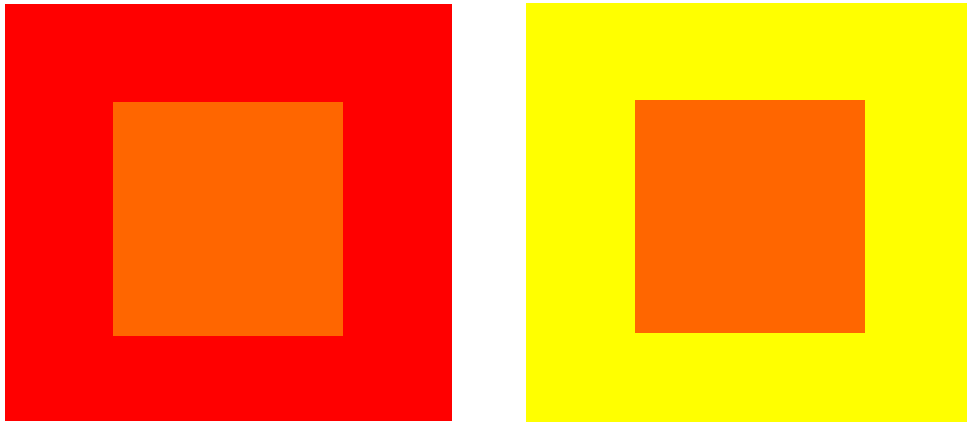
- Value, like color itself, is variable and depends on surrounding hues for its visual sensation. The center green area appears much lighter on the black background than on the white.

Color Interaction

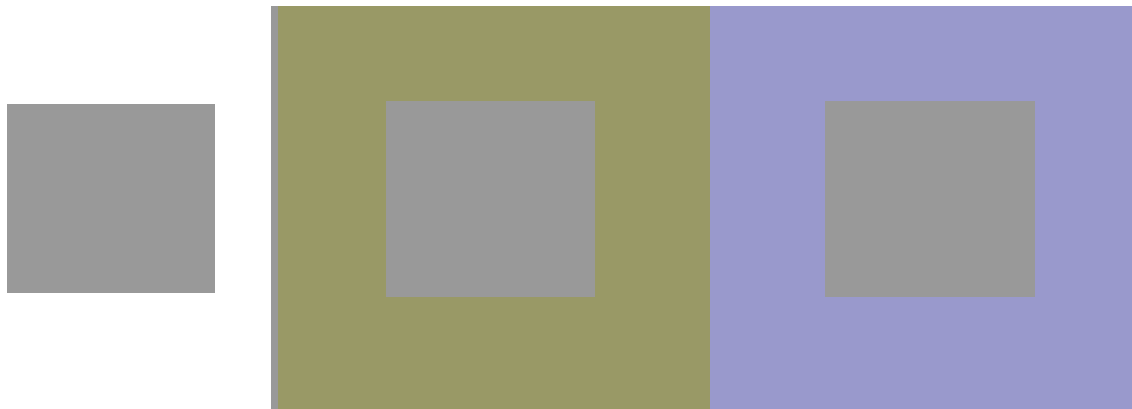
- Colors are changed by their context.
- Amount and repetition are also critical factors in color interaction. The white and green interact in a mixture effect (best perceived from a distance), produce a lighter value field of color than the green and black pattern.



- A single color may look very different on different backgrounds. This effect is easiest to achieve with secondary colors placed on their constituent primaries: an orange will look more red or yellow, and more yellow on red.



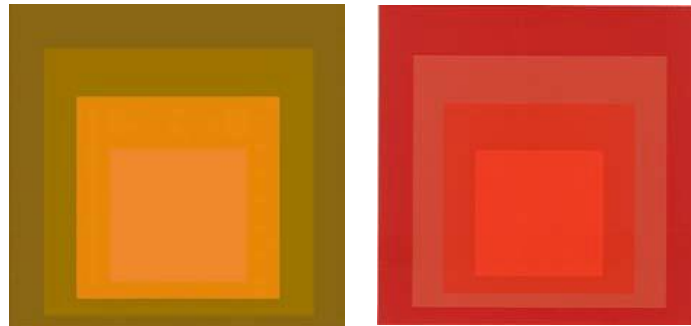
Consider this medium gray



- We can change the color we perceive it to be by varying its context or background.
- If we place this gray in the middle of an olive and a lavender field, it appears to be two very different colors.
- Because the colors are of similar **saturation** and **value**, the gray on the olive looks almost like the lavender, and the gray on the lavender looks almost like the olive. This effect becomes stronger as one stares at the edge between the lavender and the olive.

Albers' color theory focused on the dynamic, shifting nature of color in relation to its contexts: colors blurring and vibrating when placed next to one another, modifying in tonal intensity, and deepening into three-dimensional space.

- Colors shift relative to their backgrounds: a green looks more yellow on blue, more blue on yellow.
- Similar colors next to each other will have soft edges that blur.



- Saturated complementary colors next to each other will have hard edges that vibrate.



Intensity (sometimes called chroma)

Intensity refers to the **saturation** of color. Unmixed color has full intensity.

- Mixing black or white with a color changes its value and at the same time affects its intensity.



Two tints of red at the same value have different intensities.

Mixtures Lower Intensity

Two ways to lower intensity

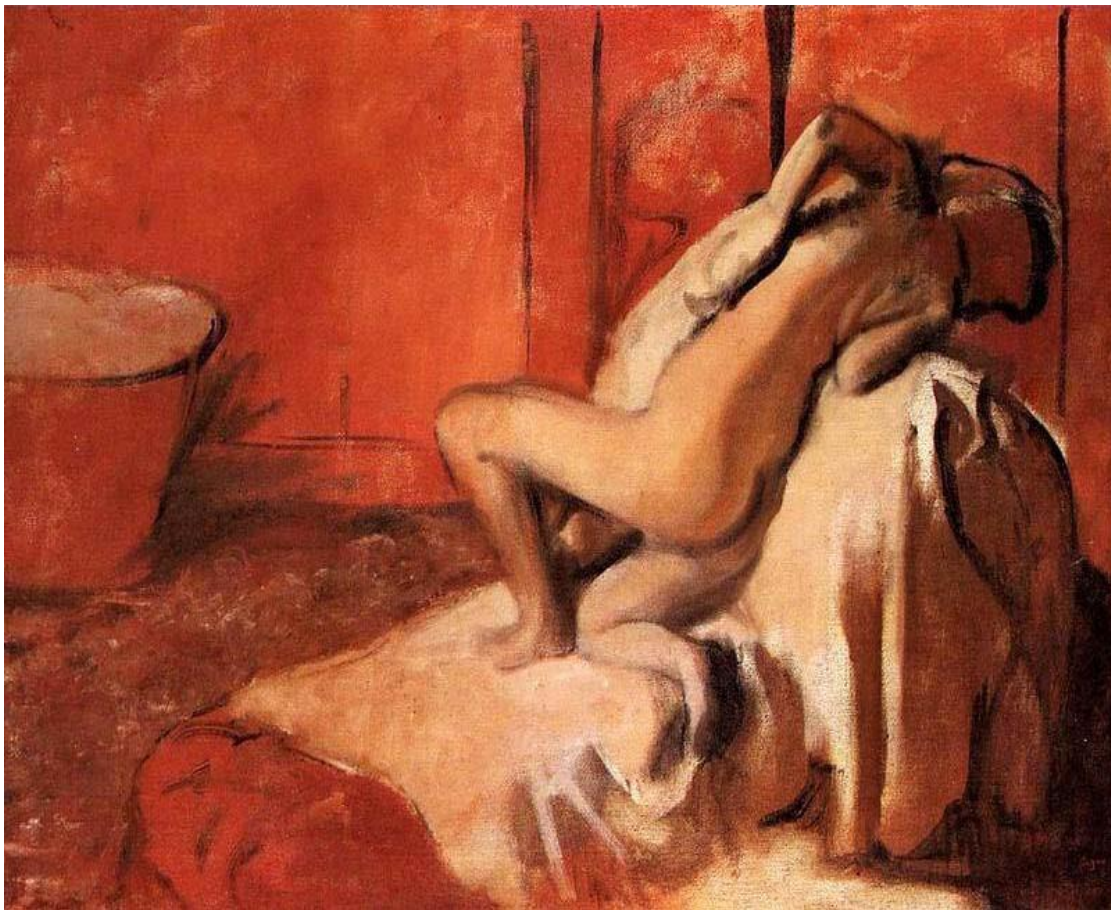
1. Mix gray with the color.
2. Mix a color with its **compliment** – the color directly across from it on a color wheel.

The image shows intensity scale involving complimentary colors blue and orange.
Neutralized (low intensity) versions of a color are often called *tones*.



Complimentary colors neutralize each other in mixture.

Neutral colors are black, white, gray, browns, beiges and tans. They do not appear on color wheel.



This Degas painting is characterized by varying intensities of a single hue. The warm red-orange ranges intensity to include flesh tones and brown. When other hues are not present, the effect of intensity is even more obvious.