

Color as Light

Objects do not have fixed colors — they reflect light. The color of an object is always a combination of its local color and the color of the light illuminating it.

BEGINNER

The single most important shift in color thinking is moving from objects-have-colors to light-creates-colors. A red apple is not simply red — in morning light it is red-orange; in blue sky shadow it is red-blue; in warm candlelight it is orange-red. The light changes the color, and understanding this is the difference between flat, copied color and luminous, convincing color. Think of any object as a neutral surface that reflects the light falling on it. The color of that light — warm (yellow, orange) or cool (blue, purple) — mixes with the object's local color to produce the actual color you see. Start noticing this in everyday life: look at a white wall and see how many different colors it actually is across its surface.

HOBBYIST

The physics of color as light leads to two key principles for artists. First: lit areas are warmer than shadow areas when the light source is warm (sun, incandescent), and cooler when the light is cool (overcast, shade). Second: the shadow areas pick up reflected light from the environment — a figure sitting near a red wall will have warm red tints in the shadow areas facing the wall. James Gurney's *Color and Light* is the most comprehensive treatment of these principles for artists. His concept of the color gamut — the range of colors physically possible in a given lighting scenario — is especially useful for planning color decisions systematically.

PROFESSIONAL

The physics of light means that any rendering claiming to be realistic must follow the optical rules of how light behaves. Physically based rendering (PBR) in 3D software is built on these same principles — the software simulates how photons actually interact with surfaces. For traditional artists, understanding color as light allows analysis of any photographic reference to identify which color information is reliable and which is an artifact of the camera or lighting setup. Painters like Monet, Sargent, and Zorn were essentially physicists of light — their color decisions followed precise observation of optical phenomena rather than conventional color mixing habits.