DEEP DIVE

Light Logic

Understanding the physics of light and how it determines every value decision you make.

Light logic is the foundational grammar of rendering. Before placing a single shade, you must understand where your light source is, what type it is, and how it interacts with your subject. Every value decision — every shadow shape, every highlight — must be answerable by light logic.

LIGHT SOURCE FUNDAMENTALS

There are three primary questions to answer before rendering any subject: Where is the light source? What type is it (direct, diffuse, ambient)? How strong is it? A single point light source (like a lamp or sun) casts defined shadows and creates high contrast. An overcast sky diffuses light from the entire upper hemisphere, producing soft, fill-heavy lighting with minimal cast shadows. Knowing the type determines how sharp your terminator is, how dark your core shadow gets, and how much reflected light to include.

LIGHT FAMILIES

Values on a form belong to one of two families: the light family (lit surfaces) or the shadow family (unlit surfaces). The critical rule: no value in the shadow family should ever be lighter than the darkest value in the light family. This keeps shadows reading as a unified dark mass and prevents the "marble effect" where forms look stippled rather than three-dimensional. Reflected light, though it lightens shadows, must stay within the shadow family — it should never approach your lit half-tones.

THE DIRECTION VECTOR

Imagine an arrow pointing from your subject toward the light source. Every surface whose normal (the perpendicular direction) roughly aligns with that arrow is lit. Every surface whose normal points away is in shadow. This mental model explains why cylindrical objects have gradual transitions, why cubes have flat-value faces, and why spheres create the classic five-tone graduation. Practicing this on simple primitives before attempting complex subjects is essential.

PRACTICAL APPLICATION

Before drawing, do a quick thumbnail to establish your light direction with an arrow. Squint at your reference — squinting merges values, making the two-family separation visible immediately. When in doubt, ask: "Is this surface facing the light?" If yes, it is in the light family. If not, it is in the shadow family. All complexity (cast shadows, reflected light, occlusion) is built on top of this binary foundation.

EXERCISES

Day 1: Draw a sphere with three different light directions (top, side, front). Keep all other variables constant. Day 2: Set up a real object (a mug, an apple) and identify every surface family before drawing a single mark. Day 3: Draw five different primitives (sphere, cube, cylinder, cone, torus) under the same light source. Day 4: Draw the same object under direct sunlight vs. overcast sky — note how shadow edges change. Day 5: Working from imagination, place three objects in a scene lit by a single lamp to the right.