ImageReason RESOURCE

Flash Falloff, Ratios, and Mixed Light

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A flash setting is not a lighting result by itself. The subject distance, aperture, ISO, modifier, and other light sources all affect the photograph. Start with the simplest useful split: direct flash is planned through a guide-number relationship; ambient exposure is planned through shutter, aperture, and ISO; a key-to-fill ratio is a relative exposure choice. Then test the arrangement you actually built.

Distance has two jobs. It changes the direct light reaching a subject, and it can create a different relationship between the subject and the background. With an ideal small direct source, doubling distance reduces illumination to one quarter. That is two stops. A large softbox close to a subject, a bounced ceiling, or reflective room surfaces do not behave like this simple point-source model, so treat the calculation as a starting condition rather than a meter reading.

For mixed light, make an ambient-only test frame first. Add the flash and decide whether the flash exposure is too high, too low, or deliberately separated from the ambient. Shutter timing often changes the ambient contribution while a normal short direct-flash burst is comparatively unaffected, but sync modes and camera behaviour matter. Change one thing at a time, check the important subject area, and keep the decisions separate.

A relative ratio between a key and fill light is an exposure statement, not a fixed recipe. A stated 4:1 or 2:1 ratio describes how many stops separate two sources under a declared comparison, most simply when both are the same distance and modifier type. Change the distance, swap a bare flash for a large diffused source, or move a light off-axis, and the same power settings no longer produce the same relative result. The ratio calculation gives you a starting number to dial in; a meter or the actual image tells you whether it produced the look you wanted.

This resource stays inside a defined boundary. It does not model TTL metering behaviour, walk through a specific flash's menu system, simulate how a softbox, umbrella, or grid actually shapes light, predict bounce colour or exposure, or provide electrical safety guidance for studio power. Those depend on the actual equipment, the room, and the camera's own metering logic, not on a distance/power/ISO relationship alone. It also does not replace a generic lighting-education property: its job is the photographic exposure and capture decision behind a lighting setup, not lighting theory as a subject on its own.

Use the Flash Guide-Number Planner to size a direct-flash aperture or distance from a stated guide number. Use the Inverse-Square Falloff Planner when the question is about how illumination changes between two distances rather than a single exposure. Use the Multi-Light Ratio Planner once more than one source is involved and the relative balance matters more than either source's absolute output. Use the Flash-Ambient Exposure Planner to keep the ambient and flash lanes separate

instead of solving them as one blended guess, and return to the Exposure Triangle Planner whenever the next question is a plain shutter/aperture/ISO trade rather than a lighting-specific one.

FAQ

Does a 4:1 ratio mean a flash should be at 25 percent power?

Only under a simplified equal-distance comparison. Distance, modifier behaviour, and flash output characteristics can change the required setting.

Can I calculate perfect flash exposure without testing?

No. Use the calculation to make a defensible first test, then meter or inspect the actual scene.