Explain the role of the inverse square law in flash photography?

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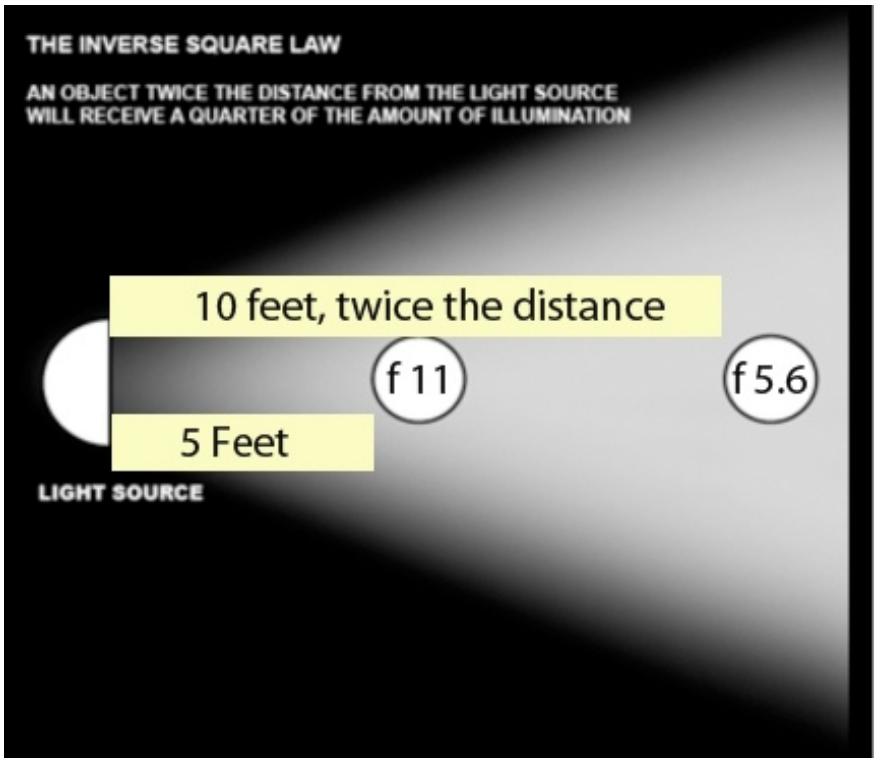
Four Flash Photography Basics we must know

The Inverse Square Law - what it means to Photographers

It's useful to know a little about the *inverse square law* especially when using flash or studio lights. Basically all the *inverse square law* says is that an object that is twice the distance from a point source of light will receive a quarter of the illumination. So what it means to us photographers is that if you move your subject from 3 meters away to six meters away, you will need four times the amount of light (or 2 stops) for the same exposure. This can most easily be achieved by opening the lens aperture two f-stops *(see* **aperture** *for an explanation)* or using a flashgun that is four times as powerful.

The reason why the power of the light diminishes so rapidly is not because it 'runs out of energy' or anything like that, but because it *spreads* and so a smaller and smaller proportion of the light hits the object. Here's a little diagram to illustrate the point.



As you can see from the diagram the beam of light fans out quite quickly and the object furthest from the light receives only a small proportion of the light, most of the beam misses the target.

In photography though we don't tend to use highly focused beams as they produce a very harsh light, too contrasty for our purposes. So the inverse square law, as a rule of thumb, works very well for us

So why do we need to know this? *If you are using flash on camera and everything is automatic then you don't need to worry about it at all.* Except you may 'run out of light' because your flashgun is not powerful enough. **It also explains the big difference in exposure between objects or people near the camera and those only a few feet further away.**

All we really need to know

An automatic camera will do all the maths for you so, unless you are using manual exposure, you don't need to worry too much about the details. It is very useful though to have some understanding of what is going on so that it doesn't come as a surprise when you see the effects of all this in under or over exposed photos. Just remember 'at twice the distance, a quarter of the light reaches the subject'.

2x the distance is 1/4 as bright, or **open 2 stops**, **1/2 the distance** is 4x brighter ***(close 2 stops)***

3x the distance is 1/9 as bright, or **open 3 stops 1/3 the distance** is 9x brighter 8x is ***(close 3 stops)***

4x the distance is 1/16 as bright, or **open 4 stops 1/4 the distance** is 16x brighter ***(close 4 stops)***

Another link Geoff Lawrence's explanation of **flash photography**