Light Intensity

2d →	$\frac{1}{4}$	$\cancel{\frac{1}{e^2}}$	$\frac{1}{2^2}$
3d →	$\frac{1}{8}$ or $\frac{1}{9}$	$\cancel{\frac{1}{e^3}}$	$\frac{1}{3^2}$
4d →	$\frac{1}{17}$ or $\frac{1}{18}$	$\cancel{\frac{1}{e^4}}$	$\frac{1}{4^2}$

$$\text{Intensity} \propto \frac{1}{d^2}$$

Goes as a sphere

- Surface area of a sphere is $4\pi r^2$

$$\text{Intensity} = \frac{\text{Initial Intensity}}{4\pi r^2}$$

This relates to gravitation!

Newton's Law of Universal Gravitation

$$F = \frac{G m_1 m_2}{r^2}$$

G is a constant

$$g = \frac{G m_2}{r^2}$$

What is this for Earth?

$$g = 9.86\ N!$$

$$F_{g\frac{1}{4}r} = \frac{G m_1 m_2}{(\frac{1}{4} r)^2} \quad \text{for } \tfrac{1}{4} r$$

$$= \frac{16\, G m_1 m_2}{r^2} = 16 F_g$$

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2)

$$g = \frac{G m_1}{r_1^{\,2}} \qquad m_1 = 2m, \quad r_1 = 3r$$

$$= \frac{G(2m)}{(3r)^2}$$

$$= \boxed{\frac{2}{9}}\boxed{\frac{Gm}{r^2}} \quad \text{Earth's } g$$

New planet's "multiplier"

$$= \frac{2}{9}\, g$$