Materials (per group): flashlight, cardboard or index card with a square cutout, yard stick, screen or whiteboard surface

Lab Protocol

1) When the classroom lights go off, stand only 1 inch from the screen or whiteboard surface. Shine the light directly at the board, noting its brightness (which you should record as 10 on a scale of 1-10).
2) Now move to a distance of 4 inches from the board. Shine the flashlight from behind the square cutout on the card while your partners measures and records the side length of the lit square image on the board. Also, use the scale of 1-10 to estimate the brightness of this larger square, compared to the original small square from step 1.
3) Repeat step 2, measuring the side length of the lit image from distances of 8 -32 inches from the lit surface. Estimate the brightness for each distance on the 1-10 scale, each compared to the original board square brightness.
4) Graph the experimental data from your data table. (Distance vs Square Length)

Data

Distance from Screen (in)	Length of Lit Square Image Side (in)	Estimated Light Brightness Change (1-10)
4		
8		
12		
16		
20		
24		
28		
32		

Find the equation between distance length, Think back to the marble energy lab.

Using your equation predict the length of a distance of 22 in.

Questions

1. How are the image size (area) and light image brightness related to the distance from the light source?

2. Write an equation that models this relationship. (Distance vs Length) Could you include brightness?

3. How would the light intensity change if the distance from a light source is doubled? tripled? quadrupled?