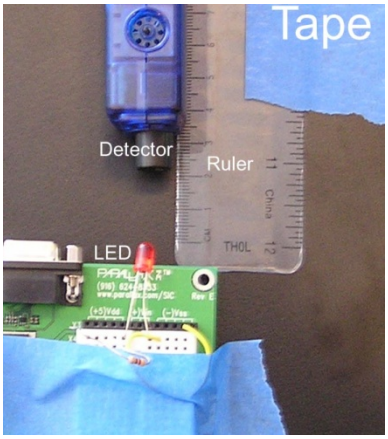
Iona Prep Physics Lab



To determine the relationship between the observed brightness of a light source and the distance from the source.

Note: we will be measuring brightness in lux. "The **lux** (symbol: **lx**) is the SI unit of illuminance and luminous emittance, measuring luminous flux per unit area. It is equal to one lumen per square meter. In photometry, this is used as a measure of the intensity, as perceived by the human eye, of light that hits or passes through a surface. It is analogous to the radiometric unit watts per square meter, but with the power at each wavelength weighted according to the luminosity function, a standardized model of human visual brightness perception. In English, "lux" is used in both singular and plural." (Wikipedia)

Procedure:

1. Set up the power source, LED, ruler, and light detector/USB Link as indicated.
2. Attach the LED holder and the ruler to the desk with masking tape so that they will not move during the experiment.
3. Set the detector so that it is 1.0 cm from the LED and looking directly at it.
4. With the LED off, record how much light is detected. Call that the ambient light reading.
5. Turn the LED on and again record how much light is detected. Call that the raw light reading.
6. Subtract the ambient light reading from the raw light reading to get the amount of light that is actually reaching the detector from the LED.
7. Repeat steps 4,5,and 6 with the detector set 2,3,4,5,6,7,8 cm from the detector and tabulate your results.
8. Set up an Excel spreadsheet – (note: the order of the columns is to make graphing easier.)
9. Use Excel to create a scatter plot of Distance vs LED light
10. Use Excel to create the following trend lines and record the equation and R^2 for each line: linear, exponential, power. Include that information in your write-up with the data table and graph.

11. Data Table:

Ambient (lx)	Raw (lx)	Distance(cm)	LED light (Raw-Ambient) (lx)
		1	
		2	
		3	
		4	
		5	
		6	
		7	
		8	

Conclusion: The best fit was (choose one: linear, exponential, power) and the equation was…