Iona Prep Physics
To determine the relationship between the perceived brightness of light and the distance from the source
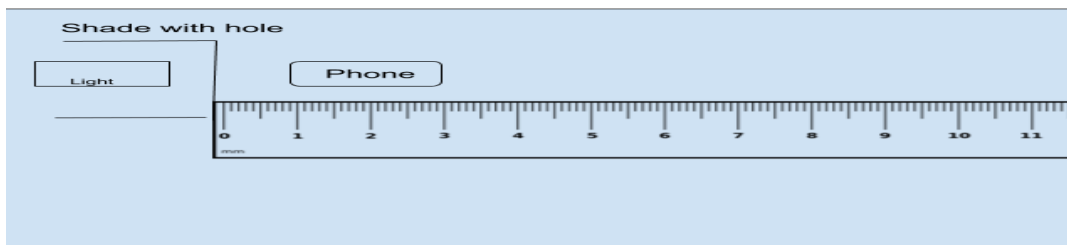
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Introduction:
It should come as no surprise that the perceived brightness of a light decreases as the distance from the light increases. In this experiment, you will try to determine the mathematical relationship between the distance from the light and the perceived brightness. The perceived brightness of light is measured in lux (abbreviated lx).[1]

Diagram

This lab needs to be done in a dark room. The darker, the better.
Take a small light (perhaps a flashlight). Place it on a long table so it is level.   Make a shade for the light by taking a piece of opaque cardboard or paper and putting a small hole in it (diameter of the hole should be about ¼ inch.) Place the shade in front of the flashlight so that most of it is blocked and some of the light comes out through the small hole.

Place a ruler on the table so that the 0 of the ruler is approximately at the hole.   Hold the phone on the table so that the light sensor is 2 cm from the hole (as measured by the ruler) and is perpendicular to the shade.

In phyphox, choose light (raw data). You can use either the graph or the simple display.

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[1] The lux is the SI derived unit of illuminance, measuring luminous flux per unit area. It is equal to one lumen per square metre. 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. Wikipedia

Create a data table with two columns: Distance in cm and illuminance in lx
Record the distance and the illuminance
Move the phone so that it is 4 cm away from the shade and again record the distance and illuminance.
Continue moving away, recording the distance and illuminance every 2 cm until you reach 30 cm.

Put your data in a spreadsheet.
Create a scatter chart
Add a trendline
Try different equations and find out which gives the best fit as judged by the R^2 value.

Conclusion: The relationship between distance and illuminance appears to be ……..(equation)