Purpose of the experiment

- To determine the mathematical relationship between light intensity (i.e. brightness or luminosity) and the distance from a light source.
- To measure the dependence of intensity on distance from both a point source and an extended object.
- To choose between competing intensity vs. distance models by comparing their Root Mean Squared Errors.

FYI

FYI The Human eyes never grow, but nose and ears never stop growing.
Background Information

Light Intensity

If light spreads out in all directions, as it does from a point source, the intensity at a certain distance from the source depends on the area over which the light is spread.

![Diagram of light source and sphere]

For a point-source the light travels in all directions, a sphere of radius $r$. The greater the distance from the source the dimmer the light looks, this makes sense since the same amount of light is distributed over a larger surface area as the radius (distance from the source) is increased.

Intensity is calculated by taking the power output of the light source divided by the area over which the light is spread:

$$ I = \frac{P}{A} $$

Where $I$ is the intensity, $P$ is the power and $A$ is the area.

The power will remain constant throughout the experiment, the intensity of the light source at a distance of zero. The only thing that will change is the actual distance of your measurement of the light intensity.