

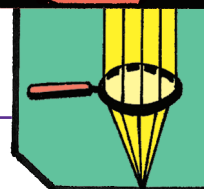


light sensor

ILLUMINANCE

MATERIAL

- a smartphone
- a tape measure
- a light source (desk lamp, smartphone flashlight ...)



optics

CHALLENGE

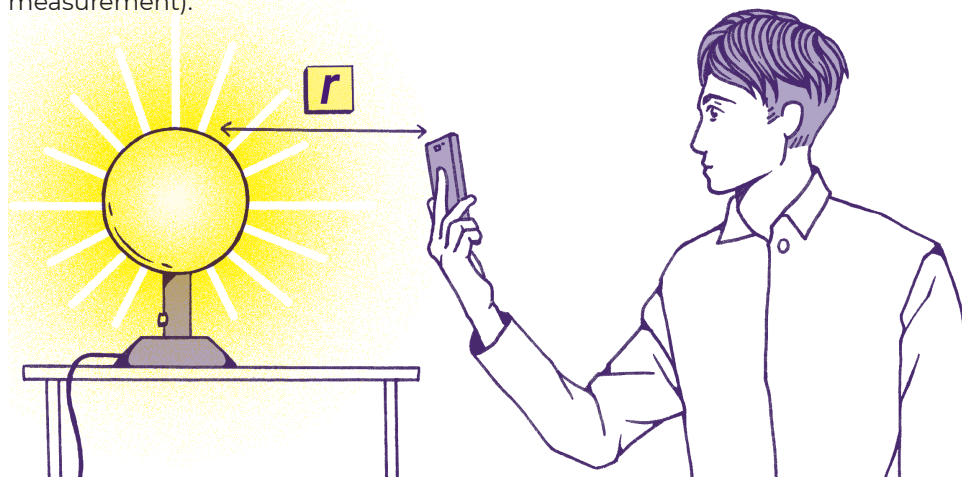
Determine how the illuminance varies when moving away from the light source.

OVER TO YOU

By working as much as possible in the dark, measure the variation of the illuminance measured by the smartphone in function of the distance between smartphone and light source. Determine the law that controls this variation.



Pro Tips: Position the light source away from any reflective wall. Take a measurement when the light source is off to determine the contribution of ambient light to the illuminance (this contribution can be subtracted from the measurement).



Plot the logarithm of light intensity versus the logarithm of distance to determine the relationship between these two quantities.

THE ULTIMATE CHALLENGE



Forget light, determine how the measured sound intensity varies in function of the distance between the sound source (a loudspeaker) and your smartphone. Watch out for reverberations on the walls!