

Paper Plate Education

"Serving the Universe on a Paper Plate"

Light Pollution

Light pollution is impinging on the quality of our night skies as wasted light results in glare, light trespass, and skyglow. Many people simply are not aware of the problem, which can be corrected with better light fixtures while saving significant energy and money. The two simple demonstrations below (borrowed from an 8-year old) show how effectively a full shield over a bare light bulb can improve the ground lighting while reducing wasted light.



To simulate an unshielded light on a pole, place a Maglite® flashlight in the free-standing "candle mode" on a white surface.



Turn off all lights and observe how the light spreads out. Look up at the ceiling, too, to see the light lost to the sky. Note how the flashlight base obstructs the light in a cone of darkness, and how the exposed bulb glares brightly in your eyes.



Now cover the exposed light with different shields and see what material improves the situation. While not practical, covering the bulb with just a hot pizza is a significant improvement.



Shields made from various materials--a pair of hands, a paper plate, a pie tin, and a hot pizza-- always improve the situation. Note how the text under the shadow cone becomes clearly visible.

You get several positive outcomes with full shields:

1. Light is directed downward to where it is wanted, so lower wattage bulbs can be used, thus saving energy and money.
2. Direct glare does not impair night vision or cause light trespass.
3. General light pollution overhead ("skyglow") is lessened.



Here is another simple illustration--again borrowed from an 8-year old.



Prop open a book that has a picture of a landscape. In this case, the view is of the Chicago skyline, with street lights in the foreground. Place a Maglite® flashlight in the free-standing "candle mode" in the foreground. Here we put the flashlight so it coincides with the street light on the right. Also place a figurine in the scene.



Turn off the room lights. Note how the figurine is in the shadow cast by the exposed light. Glare is obnoxious. Objects, like parked cars, are barely seen in the darkness beyond the glare. The sky is aglow with wasted light.



Now cover the light fully with a paper plate shield. The figurine and surrounding area is brightly illuminated. Glare is eliminated. Objects, like the parked car, are now visible beyond the light fixture. And the sky is dark.

Contributed by Sarah B., age 8.

These activities are featured in the Let There Be Night program at www.LetThereBeNight.com. See also www.nightwise.org.



[Added June 2009]

See the use of paper plates in these other activities that address outdoor lighting issues:

✘ [Activity: Turtle Hatch \(The Night You Hatched\)](#)

Demonstration shows the survival challenges of turtles (simulated by large group of kids) hatching on a beach at night. Ask your school's Student Leadership Team to partner with you for this fun demonstration.

✘ [Activity: Globe at Night](#)

Students use a starfield of Orion (drilled into a stack of paper plates) to help students find and count the stars of Orion for Globe at Night.

✘ [Activity: Heavens Above](#)

Students draw their impression of night sky highlights to show what's at risk of being lost because of light pollution.

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