

The Quality Lighting Teaching Kit: Utilizing Problem-Based Learning in Classrooms

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Abstract. The U.S. National Optical Astronomy Observatory's Education and Public Outreach group has produced a Quality Lighting Teaching Kit. The kits are designed around problem-based learning scenarios. The kit's six activities allow students to address real lighting problems that relate to wildlife, sky glow, aging eyes, energy consumption, safety, and light trespass. The activities are optimized for 11-16 year olds. As part of the IAU100 celebration, the kits will be manufactured and made available to observatories and communities around the world.

Poor quality lighting not only impedes astronomy research and our right to see a starry night sky, but creates safety issues, affects human circadian sensitivities, disrupts ecosystems, and wastes billions of dollars/year in energy consumption. It also leads to excess carbon emissions. How do you change the mindset of society that is used to turning night into day? You educate the next generation on quality lighting.

As an outcome of the International Year of Light 2015, the U.S. National Optical Astronomy Observatory's (NOAO's) Education and Public Outreach (EPO) group has produced a Quality Lighting Teaching Kit. The kits are designed around problem-based learning scenarios. The kit's six activities allow students to address real lighting problems that relate to wildlife, sky glow, aging eyes, energy consumption, safety, and light trespass. The activities are optimized for 11-16 year olds but can be expanded to younger and older. All materials are in both English and Spanish. Most of the activities can be done within in a few minutes during class or afterschool and as stations or as stand-alones. Everything you need for the six activities is included in the kit. Tutorial videos on how to do the activities can be found at www.noao.edu/education/qltkit.php. 92 out of 100 kits have been distributed in 32 countries through SPIE-The International Society for Optical Engineering, CIE-International Commission on Illuminations, OSA-The Optical Society, IDA-the International Dark Sky Association, and the IAU OAD-Office of Astronomy Development. Successful feedback has NOAO's EPO group on the cusp of commercializing the kit. The aim is to have kits available to observatories and communities around the world, as part of the Dark Skies for All flagship project during the IAU100 celebration.