

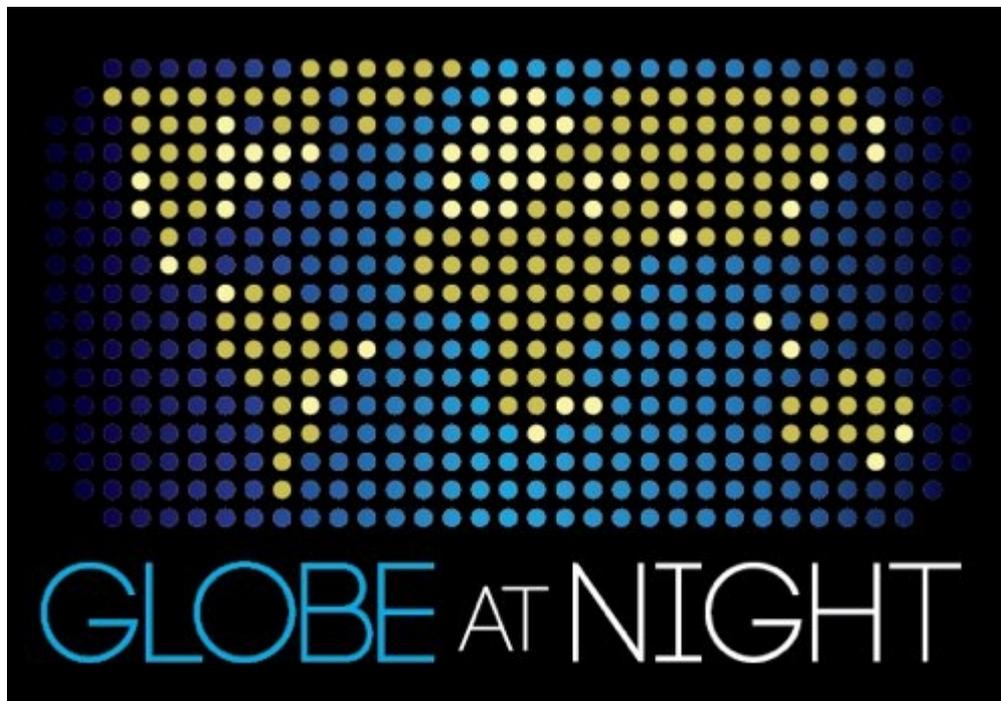
**ASTRO**EDU

Peer-reviewed Astronomy Education Activities

# Globe at Night Activity Guide

**Learn to observe and record the  
faintest visible stars to measure the  
light pollution.**

Amee Hennig, Globe at Night



 <b>AGE</b> 4+	 <b>LEVEL</b> Primary, Middle School, Secondary, University, Informal
 <b>TIME</b> 30min	 <b>GROUP</b> Group
 <b>SUPERVISED</b> Yes	 <b>COST PER STUDENT</b> Low Cost
 <b>LOCATION</b> Outdoors	 <b>CONTENT AREA FOCUS</b> Astronomy, Earth Science
 <b>ASTRONOMY CATEGORIES</b> Astronomical instrumentation, Stars	 <b>EARTH SCIENCE KEYWORDS</b> Atmospheric Sciences


**CORE SKILLS**  
 Planning and carrying out investigations, Communicating information


**TYPE(S) OF LEARNING ACTIVITY**  
 Project-based learning, Observation based



## KEYWORDS

Light pollution, Dark skies, Citizen science



## GOALS

To learn how light pollution impacts us by observation and comparing the measurements around the world.

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## LEARNING OBJECTIVES

- To employ simple equipment and tools to gather data locally.
  - Compare the acquired data with other observers.
  - Assess the impact of light pollution locally and in neighbouring areas.
  - To describe the effects of light pollution and the importance of citizen science.
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## EVALUATION

- Ask students to compare their results with others in the group and determine the reasons for different observation results.
  - Ask students to compare their results with local and neighbouring areas and assess the impact of light pollution.
  - Discuss the importance of citizen science and how it impacts real science. Some points: apart from enabling and encouraging members of the public to get involved in and appreciate the value of science, citizen science contributes to real science, especially in the age of 'big data' where scientists collect a lot of data from their observations or experiments. Citizen science allows comparison to data from automatic data reduction (where this is possible) and to spot unusual things that scientists did not expect and would not be spotted by automated processes.
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## MATERIALS

- Globe at Night Activity Packet

- Something to write on
  - Something to write with
  - Red light to preserve night vision
  - Optional: Smart mobile device, GPS unit, or a topographic map to determine your latitude or longitude
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## BACKGROUND INFORMATION

### Light pollution:

Light pollution is stray light emitted from poorly designed and aimed lighting installations. This happens mostly around urban centres, where city lights diminish the view of stars and planets. A satellite view at night shows light pollution as glowing regions around urban areas.

### Citizen science:

Citizen science is scientific research conducted, in whole or in part, by amateur or nonprofessional scientists, often by crowdsourcing and crowdfunding. Formally, citizen science has been defined as “the systematic collection and analysis of data; development of technology; testing of natural phenomena; and the dissemination of these activities by researchers on a primarily avocational basis”. Citizen science is sometimes called “public participation in scientific research.”

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## FULL ACTIVITY DESCRIPTION

### Safety note:

Be sure to wear suitable clothing for the weather and for being outside at night (light coloured and/or reflective clothing). If the engaged participants are children, they should be supervised by parents or teachers.

### Observation:

#### Step 1:

Select one constellation at <http://www.globeatnight.org/finding/> that visible on the observing night of your location. Then use the webapp on Globe at Night website to help find your constellation in the night sky.

## Step 2:

Students need to determine the location and longitude of their observation area through one of the following methods;

- use the webapp at <http://www.globeatnight.org/webapp/>. With a smart phone or tablet, the latitude and longitude are automatically determined as one reports the observation. If a student is reporting it later from the computer, he or she has to input the address of observation or the city. Zoom in/out and pan around until the observation location is found. The latitude and longitude will be displayed.
- entering the location into the webapp at <http://eo.ucar.edu/geocode/>
- GPS unit for taking a measurement. Students should report as many decimal places as the unit provides.
- topographic map of the observation area.

## Step 3:

Go outside more than an hour after sunset and be sure that the sky has darkened. The Moon should not be up. Let your eyes become used to the dark for 10 minutes before your first observation.

## Step 4:

Match your observation to one of 7 magnitude charts at <http://www.globeatnight.org/magcharts> and note the amount of cloud cover.

## Step 5:

Report the date, time, location (latitude/longitude), the chart you chose, and the amount of cloud cover at the time of observation at: <http://www.globeatnight.org/webapp/>



## CURRICULUM

Country | Level | Subject | Exam Board | Section  
— | — | — | —  
UK | KS2: Year 5 | Science | - | Earth and Space  
UK | GCSE | Astronomy | Edexcel | Topic 1.1d Planet Earth



## ADDITIONAL INFORMATION

Extend the activity further by making more observations from other locations. More observation helps to determine the light pollution around the world.

Compare your observation to thousands around the world on the interactive web map: <http://www.globeatnight.org/map/>

There are many other citizen science projects available for interested students to get involved in, such as Zooniverse, available at <https://www.zooniverse.org/#/projects>.

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## CONCLUSION

This activity engages students taking part in a global citizen science campaign to determine light pollution in a given location. Through the process students learn how to gather data and assess the impact of light pollution.

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## CITATION

Hennig, A., 2014, *Globe at Night Activity Guide*, [astroEDU](#), , [doi:10.14586/astroedu.1403](https://doi.org/10.14586/astroedu.1403)

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## ACKNOWLEDGEMENT

Connie Walker, National Optical Astronomy Observatory, Dark Skies Rangers

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