

ACTIVITY 8

GLOBE AT NIGHT

Grades :
**6 and
higher**

Level of preparation:
advanced

Student groupings:
individual

Length:
**30 minutes in class,
then 15 min at home**

Location of activity:
**at school and at
home**

BRIEF DESCRIPTION

Students participate in the international citizen-science campaign Globe at Night, which invites participants to measure light pollution in their area city and to share this data with scientists.

LEARNING GOALS

- Become familiar with a constellation visible in the sky at a particular time of the year.
- Knowing the effect of light pollution on the night sky.
- Participate in an international citizen-science project.

MATERIALS

- Visit www.globeatnight.org to find the necessary documents.
- It is not necessary to print the activity guides with the star charts since everything can now be done directly through their online app: <https://www.globeatnight.org/webapp/>

INTRODUCTION

Globe at Night is a citizen-science project which allows everyone to contribute to scientific research. The goal is to create a global map of light pollution thanks to measurements people each make in their area.

The observation itself only takes 15 minutes. Just find the constellation used as a reference for the observation period and compare your view with the provided constellation maps. The fewer stars visible in the constellation, the greater the light pollution and the lower the limiting magnitude of your site.

WHAT IS MAGNITUDE?

The magnitude is a measure of the brightness of a star, as we see in the sky. The brighter the star, the lower its magnitude. Therefore, a star with a magnitude 3 is fainter than a star with a magnitude 0. The brightest star at night, Sirius, even has a negative magnitude of -1.5. This is a somewhat strange scale that has evolved since its origins in Ancient Greece when the stars were classified into six levels, starting from Class 1 - the brightest – to class 6 - the faintest. Since then, the scale has evolved to include brighter objects with negative numbers. The human eye can see stars up to a magnitude of about 6.

The maps used indicate the limiting magnitude, or brightness, of the faintest star seen in a constellation. A sky with a limiting magnitude of 5 indicates that it is possible to see the stars with magnitude 5, which is very faint, and all stars with lower magnitudes. This site therefore offers a very black sky with little light pollution. Conversely, a sky with a limiting magnitude of 1 makes it impossible to see stars fainter than 1. This is a sky with a lot of light pollution.

PREPARATION

- Visit the Globe at Night website to determine the observation period. Several campaigns are planned throughout the year during periods without a bright evening Moon.
- Familiarize yourself with the documents related to the constellation chosen for the campaign: observation guide, online form for submitting the data

METHOD

- Introduce the project to the students and invite them to observe the proposed constellation and to enter their data in the online form. Make sure to discuss the concepts of light pollution and magnitude with them.
- To make it easier for the students to recognize the constellation in the sky, this activity could be preceded by the activity 7 on the star finder.
- During the observation period, make sure to regularly discuss the activity in the classroom and to remind them to make the observation at home in the evening. What results did they get? Are there any difficulties?

Here are **some ideas to push the activity further**:

- Explore the mythology of the constellation. Do not hesitate to research the stories associated with this constellation in different cultures, such as the ones from different Indigenous communities in Canada.
- Discuss issues related to light pollution. See “Additional Information” below for more details.
- It is also possible to analyze the data collected during the Globe at Night campaigns. Graphs and maps are available on their website: <http://www.globeatnight.org/maps.php>

ADDITIONAL INFORMATION.

Light pollution is a problem that affects much more than our view of the night sky. Its impacts are numerous: wasted energy and money, effects on our health, negative impacts on ecosystems, glare, and security. More and more studies are done on the subject and many Canadian researchers are world leaders in this field. Here are two good Canadian resources for more information on the subject:

- Light-Pollution Abatement from the Royal Astronomical Society of Canada: www.rasc.ca/lpa
- Mont-Mégantic Dark Sky Reserve: <http://ricemm.org/en>