



# Dark Skies Teachers Guidance For Dark Skies Activity Cards 1 & 2



## When did you last see the stars against a dark sky?

Even in the depths of the countryside, truly dark starry nights are becoming harder and harder to find. Security lights, floodlights and streetlights all break into the darkness, lighting up the surrounding area. Some of this light is necessary, in order to keep people safe on our streets – but much of it is wasting energy and increasing air pollution.

Light pollution can disrupt wildlife by interfering with their natural behavioural cycle, which is determined by the length of nighttime. There is also has an impact on human health such as sleep disorders, visual impairment and disrupting our natural body rhythms.

The problem is getting worse. In less than a decade, between 1993 and 2000, light pollution across England increased by around a quarter (24%). The amount of truly dark sky dropped too, from a sixth of the country to just over a tenth (11%).

## What can your school do to help?

We would like to find out the extent of light pollution in the High Weald Area of Outstanding Natural Beauty and we need help from local schools and communities to do this.

We have two activities that the children can do, one using the children's eyesight, and one using a special light sensor meter, which you can borrow from the High Weald AONB Unit.

The two activities can be found at [www.highweald.org/learn-about/education/education-resources](http://www.highweald.org/learn-about/education/education-resources)

**Activity 1 - Counting the stars with your eyes**

**Activity 2 - Measure light pollution using technology**

## When can you use these activities?

The Dark Skies activity cards can be used for the following subjects in KS2. Included below are some useful links to materials which can support lesson planning:

- **Year 3 Light:** To recognise that they need light in order to see things in the dark and dark is the absence from light.  
[www.academo.org/demos/bottle-scale/](http://www.academo.org/demos/bottle-scale/) - shows the affect of light pollution on seeing stars  
[www.need-less.org.uk/](http://www.need-less.org.uk/) - a night sky simulator
- **Year 4 environmental impact:** To recognise that environments can change and this sometimes poses dangers to living things. Example: pupils should explore examples of human impact, positive and negative on environments.  
[www.darksky.org/assets/documents/ida\\_human-health\\_brochure.pdf](http://www.darksky.org/assets/documents/ida_human-health_brochure.pdf)  
[www.britastro.org/dark-skies/](http://www.britastro.org/dark-skies/) - impact on human health
- **Year 5 Earth and Space: To explore Earth and Space.**  
[www.moonconnection.com/moon\\_phases\\_calendar.phtml](http://www.moonconnection.com/moon_phases_calendar.phtml); [www.globeatnight.org/](http://www.globeatnight.org/);  
[www.schoolsobservatory.org.uk/](http://www.schoolsobservatory.org.uk/); [www.darkskydiscovery.org.uk/](http://www.darkskydiscovery.org.uk/)
- **Year 6 Environment Adaption:** To identify how animals and plants are adapted to suit environments in different ways and adaption may lead to evolution.  
[www.darksky.org/assets/documents/ida\\_wildlife\\_brochure.pdf](http://www.darksky.org/assets/documents/ida_wildlife_brochure.pdf);  
[www.need-less.org.uk/](http://www.need-less.org.uk/)

Continued overleaf.



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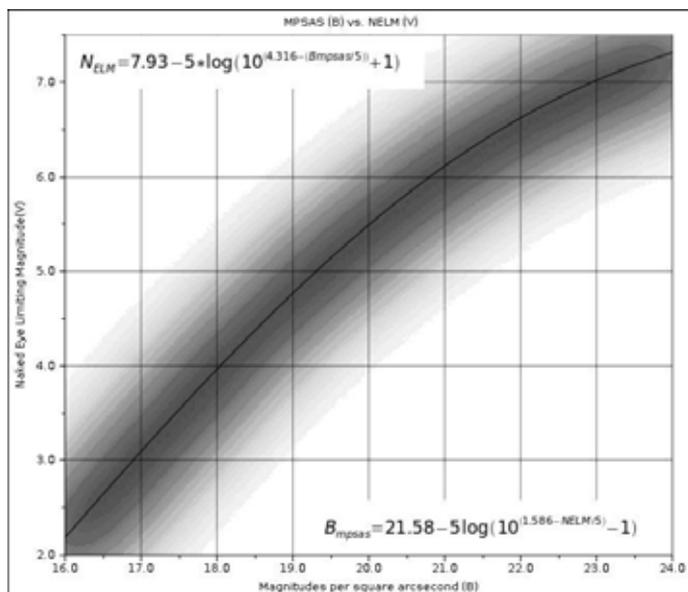
## Things to do before you start the activities!

**Find your location:** The simplest way to find the latitude and longitude coordinates of your location is by finding your recording location on Google Maps, right clicking on it, selecting "What's here?" from the resulting menu and then reading off the figures for your location's latitude and longitude that appear in the Google Maps search box (the figures for your location's latitude and longitude will also appear when you hover the cursor over – or click on – the green arrow that appears to mark your selected location).

**Find out the right time to conduct the survey:** The best time to do the surveys are at the end of January to the beginning of February when the moon is at its weakest and it gets dark early  
[www.moonconnection.com/moon\\_phases\\_calendar.phtml](http://www.moonconnection.com/moon_phases_calendar.phtml)

## Some more interesting information about the Light Sensor Meter!

If you would like to learn more about the meaning of the readings produced by the Sky Quality Meter, you first need to convert them into Naked Eye Limiting Magnitudes (NELMs), either by using this online calculator [www.unihedron.com/projects/darksky/NELM2BCalc.html](http://www.unihedron.com/projects/darksky/NELM2BCalc.html), or by using the chart below. To use the chart, simply find your reading on the horizontal x-axis. Then follow it straight up until you meet the curved line and from there straight across until you meet the vertical y-axis. The number you hit on the y-axis is your Naked Eye Limiting Magnitude!



Source: [www.unihedron.com](http://www.unihedron.com)

sites provide fun and interactive tools that will help you understand the differences between dark and light polluted skies in a more visual way.

Now that you have this number, you can find a description of your sky on the Bortle Dark Sky Scale, a nine-level scale designed to help amateur astronomers evaluate the darkness of an observing site and make comparison between sites. To find where your site fits on the Bortle Scale, simply take the Naked Eye Limiting Magnitude that you calculated previously and locate where it should go on the "Naked-eye Limiting Magnitude" column of the following Bortle Dark Sky Scale chart: [www.bigskyastroclub.org/lp\\_bortle.html](http://www.bigskyastroclub.org/lp_bortle.html). The Bortle Scale describes the darkness of a sky on a scale of 1 to 9 – the lower the number, the darker the sky!

To gain even further insight into your Sky Quality Meter reading, Naked Eye Limiting Magnitude number and Bortle Scale ranking, visit the following websites [www.need-less.org.uk/](http://www.need-less.org.uk/) and [www.academo.org/demos/bortle-scale/](http://www.academo.org/demos/bortle-scale/). These