

KS1 Lesson Plan



The countryside charity
Herefordshire



Lesson Title—Seeing Stars

Lesson time: 45 mins (plus drying time)
Key stage: KS1
Curriculum area: Art and design

This is a lesson plan developed by The Campaign to Protect Rural England (CPRE) with funding from the Royal Astronomical Society. CPRE is one of England's oldest environmental charities that works locally and nationally to protect, shape and enhance a beautiful, thriving countryside for everyone to value and enjoy. We have long been a leading voice in the campaign against light pollution. We have a special interest in this issue: darkness at night is what makes rural areas distinctive. But light doesn't respect boundaries; it can spread for miles from the source blurring town and country. Light pollution wastes energy and money; has negative effects on wildlife and more recently has sparked major concerns about the harmful effects it can have on people, not only by disrupting their sleep but the human ability to naturally produce hormones.

We have created the most detailed maps ever of Britain's night skies, using satellite data captured at 1:30am throughout September 2015. The maps are split into nine colour bands, which show the range of light levels around the country and where the darkest skies can be found. These maps can be found at this website: nightblight.cpre.org.uk

CPRE's traditional audience is usually adult but it wants to engage younger audiences with some of the key environmental issues that will face the next generation. This lesson plan is a fun and educational way for students to learn about space and environment. The lesson is particularly relevant for children living in London and other towns and cities who may have a very poor view of the night sky and may not have had the opportunity to see a dark starry night sky due to light pollution.

Learning objectives:

- To begin learning about stars and constellations
- To learn about light pollution in its simplest terms
- To recreate simple constellations seen in the northern hemisphere using paint resist techniques

Success criteria:

- Children are able to describe how stars make patterns and that we call these patterns constellations
- Children can name at least one famous constellation and make its pattern using paint resist techniques
- Children can describe light pollution in its simplest terms and have some understanding of how light pollution may affect the number of stars we can see

You will need:

Picture of the Plough constellation; picture of an old-fashioned plough farming tool; pictures of simple star constellations; A5 strong white paper (one per child), star stickers; watered down dark blue paint and paintbrushes; salt; torch



Introduction:

Ask pupils to close their eyes and imagine they are looking at the dark, night sky. What can they see? Stars, the moon, a planet, a satellite, an aeroplane? Ask them to describe the stars they can see – are they shiny, twinkly, sparkling, bright, yellow, etc. Has anyone seen a very starry night? Where was this?

Explain that many years ago, people looked at the stars and imagined they could join them up like dot to dot pictures and make animals, objects and story characters. Show the children a picture of the Plough and explain that a plough is a tool used to dig up the earth ready for planting. Show the picture of the old-fashioned plough if you have one. We can often see the Plough in the night sky as it's near to the pole star which is always visible in the sky. Has anyone seen the Plough in the sky? A group of stars that forms a pattern is called a constellation. Practise saying this together.

Development:

Explain that each child will create a starry night sky showing a constellation. Show them some pictures of simple constellations and talk about the patterns they form. Give each child an A5 piece of strong white paper and some star stickers and ask them to create a constellation with the stickers. They could create the Plough or a constellation of their choice.

Once they are happy with their constellations, ask the children to brush the dark blue paint across the picture. While the picture is wet, ask them to sprinkle some table salt across the picture and observe how the salt draws the watery paint into patterns. Leave the paintings to dry while you complete the plenary (although this may take longer than the plenary). Once dry, rub off the salt and unpeel the stickers to reveal the constellations (note – the stickers will be easier to peel away if they've had a good dousing in watery paint). If the paper is wrinkled when dry, press between heavy books overnight.

Plenary:

In order to see the stars and constellations, we need a dark sky. Introduce the idea of light pollution – this is where artificial lighting like street lights and house lights leak light into the sky, meaning we can't always see the stars.

Turn off the classroom lights and close the blinds. Reassure the children that they are safe because it won't be truly dark as it is still day time. Ask them to spot where the light creeps in under the blinds, through the windows/doors, etc. This is a bit like a night time sky, where light creeps into the sky from various sources like street lights. This means we can't always see the stars properly.

Use a torch to demonstrate how a beam of light can move and spread. Being careful not to shine the torch anywhere near the children's eyes, direct the beam to the ceiling and floor. Use your hand or a piece of paper to create a shield for the beam and show how light can shine downwards keeping the ground bright, without shining up into the sky. Remind children of the importance of turning off lights if they leave a room in school and at home.

Recap on key vocabulary: stars, constellations, the Plough, shining, etc. and finish with a story about the dark, such as *The Darkest Dark*; *The Owl Who Was Afraid of the Dark*; *Can't You Sleep Little Bear* or *Owl Babies*.

Extension/variation:

Do a survey of the school and note down the sources of light – overhead lights, outside lights, security lights, lamps, computers. If your school has sensor lights, talk about how these work by sensing movement in the room.

Ask pupils to note the light sources on the way to and from school. Can they spot street lights, security lights, shop or building lights, car headlights?

Create a class display using the starry paintings. Perhaps the children could write stories about the animals and other patterns in the stars and how they got there or use the word 'star' to create acrostic poems.

Can the children think of some nocturnal animals, like foxes, hedgehogs, badgers, moths, bats? Why do they prefer the night time? Where do they get their food from? What might happen if there is too much light at night time?