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**ENGLISH**

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Paper 1 Non-fiction

**October 2018**

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**1 hour plus 10 minutes' reading time**

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This document consists of **3** printed pages and **1** blank page.

## Text A

### The northern lights

The northern lights, a stunning display of light that can sometimes be seen in the night sky of the northern hemisphere, have been fascinating people for generations. Each appearance of the northern lights is unique. Often, several bands of light are seen like flickering curtains across the night sky. Or the lights appear as rolling smoke. The colour is usually a luminous green, often with a hint of pink along the edge, and occasionally with a deep violet centre.

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#### The science behind the northern lights

The sun is responsible for the occurrence of the northern lights. During large solar explosions and flares, huge quantities of particles are thrown out of the sun and into space. When these particles meet the Earth's magnetic shield, they are drawn towards a circle around the magnetic North Pole, where they interact with the upper layers of the atmosphere. The energy released becomes the northern lights. This incredible display happens approximately 100 kilometres above our heads.

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If the solar activity is particularly intense, the northern lights suddenly explode and appear in the form of a bright circle around the moon for a minute or two, then just as dramatically disappear. All of this makes people wonder if what they have seen was real or just an Arctic mirage.

#### Living legend

Unsurprisingly, the spectacle of the northern lights has given rise to as many legends as there have been people watching them. During the Viking Age, the northern lights were said to be the armour of the Valkyrie (female warriors from Norse mythology) shedding a strange, flickering light.

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The Sami, indigenous people of much of the Arctic Circle, traditionally associated the northern lights with sound. Symbols representing the northern lights are found on the drums of the Sami people. The northern lights have several different names in the Sami language. They are, for instance, known as *guovssahas*, meaning the light which can be heard.

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#### Viewing the northern lights

If you are dreaming about seeing the northern lights, you must remember that you are at the complete mercy of nature. The lights love to play hide and seek. Observing them is often a struggle between the viewer's patience and the lights themselves. By staying in the right area for at least a week, preferably two, you can be rewarded – unless the weather suddenly decides to obstruct your view with clouds.

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**Text B****Stargazing**

In some parts of the world, on a clear night, you can see about 4 000 stars sparkling in our universe.

Stargazing is best done before the moon is full, so it might be worth looking at the next new moon dates before you give it a go. The best time for stargazing is in winter – all the best starscapes can be seen then. If you get the timing right, a meteor shower can be an incredible spectacle. This does require a little patience though, so might not be ideal for the very youngest children.

Light pollution is a growing issue for amateur astronomers, but with many sites far away from towns and streetlights, you can still get a wonderfully clear view of the night sky. Make sure you take warm clothes – even on a balmy summer evening, with clear skies above, stargazing can get chilly. A hot drink never goes amiss either.

Some great stargazing spots can now be found on the Dark Sky Discovery network, an online map of all the fantastic places with a good view of the night sky. You should try to avoid sites with hills or lots of trees as these can block your view.

Try to see if you can spot the glow of the Andromeda Galaxy. Two million light years away, this is the most distant object the human eye can see. If you use binoculars, you should be able to see Andromeda's unusual egg shape. It wasn't until people saw the moon through binoculars that they realised it wasn't a perfect sphere either. On a clear night, it's easy to see the moon's craters and bumpy edges. Kids will love this sight!

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