

# The Northern Lights



## Introduction

This lesson is about the northern lights. You will practise your speaking and listening skills, learn and review some useful vocabulary, and complete a listening comprehension quiz.

## Warm Up

What do you know about the northern lights? Look at the statements below.

Which ones do you think are true?

- A. The northern lights are displays of light in the sky.
- B. The light displays are triggered by storms and winds from the Sun.
- C. The northern lights are best seen during daylight hours.
- D. Another name for the northern lights is the aurora borealis.
- E. The northern lights sometimes appear in the southern hemisphere.

## First Listening

Watch the video again to find the answers to the questions below.

**1) The video is...**

- ☐ a documentary about two film makers
- ☐ a documentary about a news story
- ☐ a news story about a documentary
- ☐ a documentary about the northern lights

**2) Which of these things is not mentioned in the video?**

- ☐ the weather conditions
- ☐ the names of the film makers
- ☐ where the film is being made
- ☐ how long it will take to shoot the film

**3) According to the video...?**

- ☐ the northern lights are only visible in spring
- ☐ few people ever get to see the northern lights
- ☐ Norway is the best place to see the northern lights
- ☐ the northern lights are a rare phenomenon

**4) True, false, or we don't know? The film is being shot high up in the mountains.**

- ☐ true
- ☐ false
- ☐ we don't know

**5) True, false, or we don't know?**

**The completed film will be shown in cinemas around the world.**

- ☐ true
- ☐ false
- ☐ we don't know

*\* To review more vocabulary, a complete transcript of the video can be found at the end of the document.*

Complete the gaps in the text below with the correct article (a, an, or the).

## What is an Aurora?

Named after  Roman goddess of dawn, auroras are  captivating display of light in  night sky.  aurora borealis and aurora australis - also called  northern lights and southern lights - occur at  northern and southern poles. Sometimes, space weather interacting with Earth can cause auroras to extend even further away from  poles.  dancing lights of auroras provide spectacular views from  ground. These colourful lights are constantly changing shape and intensity, from dim and scattered to bright enough to read by.

Sun continuously produces  solar wind, made of charged particles that flows outward into  solar system. When  solar wind reaches Earth's magnetic field, it can cause magnetic reconnection,  explosive process that allows charged particles from space to accelerate into  atmosphere.

Earth's magnetic field - called  magnetosphere - continuously oscillates and responds to  changing intensity of  solar wind.  solar wind particles funnel around to  long tail of  magnetosphere, where they become trapped. When magnetic reconnection occurs,  particles are accelerated toward Earth's poles. Along  way, particles can collide with atoms and molecules in Earth's upper atmosphere,  interaction that provides  atoms with extra energy which is released as  burst of light. These interactions continue at lower and lower altitudes until all  incoming energy is lost. Whenever we see  glowing aurora, we are watching  billion individual collisions, lighting up  magnetic field lines of Earth.

Studying  auroras helps scientists understand  way it affects communication signals and human technology. Scientists study auroras from  variety of vantage points: below, above, and within. From below, ground based telescopes and radar look upward to track what's happening in  sky. From above, NASA missions investigate what causes auroras to dramatically shift from slowly shimmering waves of light to wildly shifting streaks of color.

To gather observations from within  aurora, NASA uses sounding rockets - rockets that take  brief, quick trip through space - to fly right up into auroras as they happen in real time. Citizen scientists around  world play  part also, by helping NASA to track and observe auroras.

Observing auroras, and discovering what causes them to change over time, gives scientists insight on how our planet's magnetosphere reacts to  space weather near Earth.



## Transcript

A pair of documentary makers have gone in search of the aurora borealis in Norway, as they look to make a short film about the science behind the northern lights. Francisco Matos and Par Lund have made their way to one of the most northern places in the world, which can boast a permanent human population. The pair have spent most nights heading up high into the mountains in search of locations where they can film time-lapse footage.

"I really want to make a movie that people are going to see all over the world and understand better what northern lights are, because northern lights...uh...it's like a phenomenon the few people in the world have the opportunity to see. And once you film really well and you go after answers with scientists and everything, people can get to understand what they are. You usually have to go far from the town up to the mountains, and you need a low light sensitive camera. And what else you need? Ah you need good equipment, good gear, for the cold because in the regions where you see northern lights, it's very, very cold. Temperatures can go up to -35, so you need good gear, and you need to set up your camera before you go out."

The northern lights are the result of collisions between the earth's gas particles and matter released by the sun's atmosphere. The collisions can jar the magnetosphere around the earth's north and south poles, releasing colorful streams into the sky. It can often take Matos and Par hours of driving their snowmobiles in extreme terrain and arctic conditions to find suitable spots away from the town where there is no light pollution.