

## Students' worksheet for Northern lights package

During the lesson, fill in following tasks.

### Task 1.

After watching videos of aurora and a short lesson answer 3 questions:

What colours may aurora have?.....

What words or phrases would you use to describe the movement of aurora in the sky?.....

Name the atoms, which may get excited and glow?.....

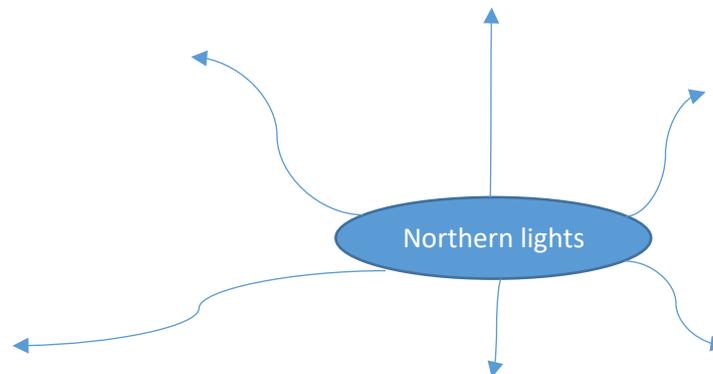
### Task 2.

The sun goes through periodic variations or cycles of high and low activity. Check, how long this solar activity cycle lasts and write down this information. ....

### Task 3.

In order to better remember the new concepts, you may create a mind map (on a separate piece of paper or just below). You may consider following aspects to use:

- region of appearance
- part of the atmosphere
- colors
- excited atoms
- height above ground
- source of energy



Task 4.

Let's now try to chase aurora. Go to the [NOAA website with the space weather forecast](#) and check, where you should travel to have a chance watching aurora.

Name this place (country, island etc.).....

Next, check on the [NOAA website](#), what was the Kp index in last 3 days. Did people living in the north had the chance to see aurora? .....

If it was low in last 3 days, you may check 30-day-history on the website: [NOAA](#). If you find proper index, write the latest date, when the value was high:..... and write the Kp index value:.....

If in the last 30 days the Sun activity was low, you may look further into data collected by NOAA since 1994: [NOAA Database](#) - check the latest file with Daily Geomagnetic Data (DGD) and find the latest day, when the Kp was high. Write down the date and value.

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Compare also the K index for high and middle latitudes and Kp and based on your findings underline the correct words.

K index for high latitudes is *higher/lower* than for middle latitudes. Moreover, the Kp index is usually *higher/lower* than the K index for high latitudes, whereas Kp is *higher/lower* than the K index for middle latitudes.

Task 5.

**Mercury** has a magnetosphere and so we might expect aurora there too. But, there are no auroras.

Find out why and write down the explanation: .....

.....  
.....

Task 6.

For long time scientists thought that there are no auroras on **Mars**. A discovery from 2016 showed that Mars has much larger auroras spread across the northern hemisphere, and probably the whole planet too.

Find out, how Martian auroras differ from ours and write down your answer.

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.....  
.....  
.....

## Task 7.

Check yourself!

**1. Auroras may appear** (multiple answers)

- near the north magnetic pole
- near the south magnetic pole
- on Mercury
- on Jupiter

**2. The aurora occurs when highly charged particles from the solar wind interact with gases in the Earth's atmosphere.**

TRUE

FALSE

**3. The most popular color of aurora is green. It is connected with excited atoms of**

- Nitrogen
- Oxygen
- Argon

**4. Auroras are mainly formed at altitudes**

- 1-2 km
- 20-40 km
- 100-200 km
- 500-1000 km