

Science

Grade 5

Northern lights reading comprehension: why the sky glows

Read how the Sun and Earth's magnetic field paint the night sky, then find causes and effects.



I can explain the cause-and-effect steps that make an aurora.

1



Lights in the sky



On some dark nights, curtains of green, red and purple light ripple across the sky. These are the northern lights, also called the aurora borealis. They may look like magic, but they start about 93 million miles away, at the Sun.

The Sun sends out a steady stream of tiny charged particles called the solar wind. Sometimes a solar storm blasts out a much bigger burst of particles. When these particles reach Earth, they meet Earth's magnetic field, an invisible shield around our planet.

The magnetic field guides the particles toward the North and South Poles. There, they crash into gases high in the atmosphere. The gases give off light when they are hit. Oxygen glows green or red, and nitrogen glows blue or purple.

The Sun has a cycle of about 11 years. When it is most active, there are more solar storms, so auroras are brighter and can sometimes be seen farther from the poles.

2



Cause and effect

Draw a line from each cause to its effect.

☐

A solar storm happens.

☐

The magnetic field guides particles.

☐

Particles hit oxygen high in the sky.

☐

The Sun is at its most active.



A. A green or red glow appears.



B. Auroras can be seen farther from the poles.



C. A big burst of particles flies toward Earth.



D. The particles travel toward the poles.

3



From Sun to sky

Write 1 to 4 in the boxes.

☐

The particles hit gases in the atmosphere.

☐

The Sun sends out charged particles.

☐

The gases glow and we see an aurora.

☐

Earth's magnetic field guides the particles to the poles.

4



Check your reading

Circle the best answer.

1. What is another name for the northern lights?

A aurora borealis

B solar wind

C magnetic field

2. Which gas glows blue or purple?

A oxygen

B nitrogen

C helium

3. About how long is the Sun's activity cycle?

A 1 year

B 11 years

C 100 years

5 True or false

Circle True or False. Look back at the text.

1. The northern lights start at the Sun.

True

False

2. The solar wind is made of tiny charged particles.

True

False

3. Earth's magnetic field guides the particles toward the equator.

True

False

4. Oxygen can glow green or red.

True

False

5. The Sun's activity cycle lasts about 5 years.

True

False

6. Auroras happen high in the atmosphere.

True

False

6 Science words

Use the words: solar wind, magnetic field, atmosphere, poles, oxygen, nitrogen.

1. The steady stream of charged particles from the Sun is the _____.

2. Earth's _____ is like an invisible shield.

3. The layer of gases around Earth is the _____.

4. The particles are guided toward the North and South _____.

5. When particles hit _____, it glows green or red.

6. When particles hit _____, it glows blue or purple.

7

**At the Sun or near Earth?**

Write each event in the right column.

A solar storm blasts out particles.

The magnetic field guides particles.

The solar wind starts.

Particles hit gases in the air.

Activity rises and falls in an 11-year cycle.

Oxygen glows green.

At the Sun**Near Earth**

8

**Think deeper**

Circle the best answer.

1. Why can auroras be seen farther from the poles when the Sun is most active?

A There are more solar storms.

B The Moon is brighter.

C Earth stops spinning.

2. About how far away is the Sun?

A 93 thousand miles

B 93 million miles

C 93 miles

3. Which word in the text means "moves in small waves"?

A ripple

B blast

C guide

4. What is the main idea of the text?

A Oxygen is the only gas in the air.

B Auroras only happen in winter.

C Auroras glow when particles from the Sun hit gases high above Earth.

9



Explain it

Why do people in Alaska see the northern lights more often than people in Florida? Use details from the text.

How did it go?



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Answer key

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The magnetic field guides the particles toward the North and South Poles. There, they crash into gases high in the atmosphere. The gases give off light when they are hit. Oxygen glows green or red, and nitrogen glows blue or purple.

The Sun has a cycle of about 11 years. When it is most active, there are more solar storms, so auroras are brighter and can sometimes be seen farther from the poles.

2



Cause and effect

Draw a line from each cause to its effect.

C

A solar storm happens.



D

The magnetic field guides particles.



A

Particles hit oxygen high in the sky.



B

The Sun is at its most active.



A. A green or red glow appears.



B. Auroras can be seen farther from the poles.



C. A big burst of particles flies toward Earth.



D. The particles travel toward the poles.

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From Sun to sky

Write 1 to 4 in the boxes.

3

The particles hit gases in the atmosphere.

1

The Sun sends out charged particles.

4

The gases glow and we see an aurora.

2

Earth's magnetic field guides the particles to the poles.

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6 Science words

Use the words: solar wind, magnetic field, atmosphere, poles, oxygen, nitrogen.

1. The steady stream of charged particles from the Sun is the solar wind.

2. Earth's magnetic field is like an invisible shield.

3. The layer of gases around Earth is the atmosphere.

4. The particles are guided toward the North and South poles.

5. When particles hit oxygen, it glows green or red.

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**At the Sun or near Earth?**

Write each event in the right column.

A solar storm blasts out particles.

The magnetic field guides particles.

The solar wind starts.

Particles hit gases in the air.

Activity rises and falls in an 11-year cycle.

Oxygen glows green.

At the Sun

A solar storm blasts out particles., The solar wind starts., Activity rises and falls in an 11-year cycle.

Near Earth

The magnetic field guides particles., Particles hit gases in the air., Oxygen glows green.

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**Think deeper**

Circle the best answer.

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A There are more solar storms.**B** The Moon is brighter.**C** Earth stops spinning.

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4. What is the main idea of the text?

A Oxygen is the only gas in the air.**B** Auroras only happen in winter.**C** Auroras glow when particles from the Sun hit gases high above Earth.

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Explain it

Why do people in Alaska see the northern lights more often than people in Florida? Use details from *Earth's magnetic field guides the Sun's particles toward the poles. Alaska is much closer to the North Pole than Florida, so the particles hit the atmosphere above Alaska more often and make the sky glow there.*

How did it go?



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