Name: _____ Date: _____

What Causes the Northern Lights

Circle group

On a dark, clear night in northern Canada, Alaska, or Norway, the sky can fill with curtains of green light. The curtains ripple and drift. This glow is called the aurora borealis, or the northern lights. It looks like magic. But there is a science reason, and it starts ninety-three million miles away at the sun.

The sun always sends out a stream of tiny charged particles. This is called the solar wind. Most of the particles would zoom right past Earth. But Earth has a magnetic field. It is an invisible shield that bends their paths. The field is weakest near the north and south poles. So the particles are guided down toward those places.

Far above the ground, about sixty miles up or higher, the particles crash into atoms of gas in the upper atmosphere. Each crash gives an atom extra energy. The atom gets rid of the energy by giving off a tiny flash of light. Millions of flashes at once make the glow we see.

The color depends on the gas and the height. Oxygen atoms usually glow green. This is the most common color of the aurora. At great heights, oxygen can glow red. Nitrogen can add blue or purple edges.

The same thing happens at the other end of the planet. There it is called the aurora australis, or the southern lights. Auroras are strongest when the sun is very active. People who want to see them go far from city lights and wait for a dark night with no clouds.

Questions

1. What is another name for the northern lights?

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_____

2. What is the solar wind?

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_____

3. What does Earth's magnetic field do to the particles?

_____

_____

4. What color do oxygen atoms usually glow?

_____

_____

5. What are the southern lights called?

_____

_____

6. Why are auroras seen mostly near the poles?

_____

_____

7. Why do people go far from city lights to see an aurora?

_____

_____

Words to know

aurora: a glowing display of light in the night sky
magnetic: having to do with the force that pulls on certain metals
particles: extremely tiny pieces of matter
atmosphere: the layer of gases that surrounds a planet

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

What Causes the Northern Lights

Triangle group

On a dark, clear night in places such as northern Canada, Alaska, or Norway, the sky sometimes fills with curtains of green light that ripple and drift. This glowing display is called the aurora borealis, or the northern lights. It looks like magic, but it has a scientific explanation that begins ninety-three million miles away, at the sun.

The sun constantly sends out a stream of tiny charged particles called the solar wind. Most of these particles would sweep right past Earth, but our planet is surrounded by a magnetic field, an invisible shield that bends their paths. Earth's magnetic field is weakest near the north and south poles, so the particles are guided down toward those regions.

High above the ground, at a height of roughly sixty miles or more, the particles crash into atoms of gas in the upper atmosphere. Each collision gives an atom extra energy, and the atom gets rid of that energy by giving off a tiny flash of light. Millions of these flashes at once make the glow we see.

The color depends on the gas and the height. Oxygen atoms usually glow green, which is the most common color of the aurora, and sometimes red at great heights. Nitrogen can add blue or purple edges.

The same thing happens at the opposite end of the planet, where it is called the aurora australis, or southern lights. Auroras are strongest when the sun is especially active. Skywatchers who want to see them try to get far from city lights and wait for a dark, cloudless night.

Questions

1. What is another name for the northern lights?

_____

_____

2. What is the solar wind?

_____

_____

3. What does Earth's magnetic field do to the particles?

_____

_____

4. What color do oxygen atoms usually glow?

_____

_____

5. What are the southern lights called?

_____

_____

6. Why are auroras seen mostly near the poles?

_____

_____

7. Why do skywatchers try to get far from city lights?

_____

_____

Words to know

aurora: a glowing display of light in the night sky
magnetic: having to do with the force that pulls on certain metals
particles: extremely tiny pieces of matter
atmosphere: the layer of gases that surrounds a planet
collision: a crash when two things hit each other

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

What Causes the Northern Lights

Square group

On a dark, cloudless night in places such as northern Canada, Alaska, or Norway, the heavens sometimes fill with shimmering curtains of green light that ripple and drift across the horizon. This spectacular display is called the aurora borealis, or the northern lights. It appears almost magical, yet it has a thoroughly scientific explanation that begins ninety-three million miles away, at the sun.

The sun continually emits a stream of minuscule charged particles known as the solar wind. Most of these particles would sweep straight past Earth, but our planet is enveloped by a magnetic field, an invisible shield that deflects their paths. Because this field is weakest near the north and south poles, the particles are funneled down toward those polar regions.

High above the ground, at a height of roughly sixty miles or more, the particles slam into atoms of gas in the upper atmosphere. Each collision gives an atom a burst of extra energy, and the atom discharges that energy by releasing a tiny flash of light. Millions of these flashes occurring simultaneously produce the glow that we see.

The color depends on both the type of gas and the altitude. Oxygen atoms usually glow green, which is the most common color of the aurora, and they sometimes glow red at very great heights. Nitrogen can contribute blue or purple fringes.

An identical process unfolds at the opposite end of the planet, where it is called the aurora australis, or the southern lights. Auroras are most intense when the sun is especially active. Skywatchers hoping to witness one travel far from city lights and wait patiently for a dark, cloudless night.

Questions

1. What is the alternate name for the northern lights?

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2. What is the solar wind?

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_____

3. What does Earth's magnetic field do to the particles?

_____

_____

4. What color do oxygen atoms usually glow?

_____

_____

5. What are the southern lights called?

_____

_____

6. Why are auroras observed mainly near the poles?

_____

_____

7. Why do skywatchers travel far from city lights to witness an aurora?

_____

_____

Words to know

aurora: a glowing display of light in the night sky
magnetic: having to do with the force that pulls on certain metals
particles: extremely tiny pieces of matter
atmosphere: the layer of gases that surrounds a planet
collision: a crash when two things hit each other

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: What Causes the Northern Lights

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: What Causes the Northern Lights

Easier · 258 words · Flesch-Kincaid grade 4.8

1. The aurora borealis.
2. A stream of tiny charged particles from the sun.
3. It bends their paths and guides them toward the poles.
4. Green.
5. The aurora australis.
6. Earth's magnetic field guides the particles down toward the poles.
7. Bright lights make it hard to see the faint glow.

Triangle: What Causes the Northern Lights

This passage · 263 words · Flesch-Kincaid grade 8.4

1. The aurora borealis.
2. A constant stream of tiny charged particles from the sun.
3. It bends their paths and guides them toward the poles.
4. Green.
5. The aurora australis.
6. Earth's magnetic field guides the particles down toward the polar regions.
7. Bright lights would make it hard to see the faint glow of the aurora.

Square: What Causes the Northern Lights

Harder · 275 words · Flesch-Kincaid grade 10.4

1. The aurora borealis.
2. A continual stream of minuscule charged particles from the sun.
3. It deflects their paths and funnels them toward the polar regions.
4. Green.
5. The aurora australis.
6. Earth's magnetic field funnels the particles down toward the polar regions.
7. Bright city lights would drown out the faint glow of the aurora.