



মণিপুরৰ শাসনৰত্ন (মণি)  
**DEPARTMENT OF EDUCATION (S)**  
Government of Manipur

**CLASS IX**  
**ENGLISH COURSE BOOK**  
**UNIT II - MYSTERY**  
**LESSON B – ARORA BOREALIS OR THE NORTHERN LIGHTS**

**SOLUTIONS**

**EXERCISES**

**A. Based on your reading of the lesson, complete the following statements:**

- The planets and other heavenly bodies make the night sky a vast illusion, but so very beautiful.
- The Northern Lights seem like a huge draper of various colour spanning the whole length and width of the northern sky is billowing in the sky.
- Long ago, emotions like fear and wonder were created by the Northern Lights in the people who witnessed them.
- The Fox Indians believed the aurora to be an omen of war and pestilence. They believed that lights were the ghosts of their slain enemies, restless for revenge, trying to rise up again.
- The sun, being a nuclear reactor, is continually emitting highly charged particles containing positive ions into space due to the nuclear process that is going on in it.
- The earth's magnetic field sends the ions from the solar wind to the earth's two poles.
- On the strength of the solar wind depends the frequency, duration and visibility of the Northern Lights.
- The first space flights confirmed the Northern Lights' connection with solar winds and the earth's magnetic field.



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**B. Answer the following questions a sentence each:**

- a. How is the mystery of light display towards North Pole known as?**

**Ans:** The mystery of light display towards North Pole is known as Aurora Borealis or the Northern Lights.

- b. According to Earnest W. Hawkes' account, how do the spirits pass through to heaven?**

**Ans:** According to Earnest W. Hawkes' account, there is a hole in the great dome of hard material arched over the earth and through it, the spirits pass to heaven.

- c. How did the Point Barrow Eskimos try to protect themselves from Aurora Borealis?**

**Ans:** The Point Barrow Eskimos tried to protect themselves from Aurora Borealis by carrying knives.

- d. What do most Eskimos believe about the Northern Lights?**

**Ans:** Most Eskimos believe that the Northern Lights are the spirits of the dead playing ball with a walrus or with human skull.

- e. According to East Greenland Eskimos what is the legend connected with the Northern Lights?**

**Ans:** According to East Greenland Eskimos legend, the Northern Lights were the spirits of children who died at birth.

- f. What is solar wind?**

**Ans:** Solar wind is the flow of the highly charged particles containing positive ions which are emitted by the sun into the space and which are scattered at the high speed of 1 – 86 million miles per hour.

- g. On what does the colour of light depend?**

**Ans:** The colour of light of the Northern Lights depends on the type of gas or atoms involved in catching the loose electrons which are knocked out of atoms in the upper atmosphere by the particles emitted by the sun.



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**C. Answer the following questions briefly:**

**a. Explain the reality and illusion that exist between the sun and the earth?**

**Ans:** Various illusions exist between the sun and the earth and some of them we have been able to explain. The earth is round but looks flat. The planet and other heavenly bodies are stars making the night sky a vast illusion but so very beautiful. The earth is a vast magnet making life possible on it. One such mystery of nature is the Northern Lights or Aurora Borealis.

**b. According to Earnest W. Hawkes' account, what did the Eskimos believe about the whistling cracking sound?**

**Ans:** According to Earnest W. Hawkes' account, the Eskimos believed that the whistling cracking sound accompanying the aurora borealis at times was the voices of the spirits of those who died a voluntary or violent death trying to communicate with the people on earth.

**c. How did the East Greenland Eskimos interpret the mystery of Modern Lights?**

**Ans:** According to East Greenland Eskimos legend, the Northern Lights were the spirits of children who died at birth and the dancing of the children round and round caused the continually moving streams and draperies of the aurora.

**d. Why did the Scandinavians call the Northern Lights Herring Flash?**

**Ans:** The Scandinavians called the Northern Lights Herring Flash because the flickering lights of the Northern Lights resemble a school of fish swimming by.

**e. How do ions emit light when they reach earth's upper atmosphere?**

**Ans:** When the ions emitted by the sun reach the earth's upper atmosphere, they move so fast that they knock electrons out of atoms in this atmosphere. When these loose electrons are caught by another atom, light is emitted. Thus, the ions emit light when they reach earth's upper atmosphere.

**f. What is the contribution of twentieth century science in explaining the Northern Lights?**

**Ans:** The twentieth century science contributes significantly in explaining the Northern Lights. The Northern Lights' connection with solar winds and the earth's magnetic field was developed only in the early twentieth century. The theory was later confirmed by data obtained during the first space flights toward the middle of the twentieth century.

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