

Alaska

COMPREHENSIVE SYSTEM OF STUDENT ASSESSMENT STANDARDS BASED ASSESSMENTS (SBA)

Reading Item Sampler

Grade 9



Alaska Department of Education & Early Development

INTRODUCTION

The Assessment Item Sampler is designed to help teachers assist students to do their best on the Alaska Comprehensive System of Student Assessment, Standards Based Assessments in grades 3 through 9. Data Recognition Corporation, the contractor designing the Standards Based Assessments, produced this item sampler from questions developed for Alaska.

The Standards Based Assessments are designed to estimate the degree to which students have mastered the Academic Performance Standards for reading, writing, and mathematics outlined in the Grade Level Expectations. These assessments are written specifically for Alaska and are the foundation of the Alaska school accountability system. Results are valuable for districts, schools, and students. Results are used to measure a school's Adequate Yearly Progress in accordance with No Child Left Behind. Additionally, these assessments, because they are consistent across grade levels, provide the ability to gauge students' academic progress. This test combined with other information from classroom and local assessments provides districts with valuable student performance data and degrees of mastery.

The Assessment Item Sampler was developed to give students and teachers a practical way to become familiar with the kinds of test questions that will appear on the Standards Based Assessments. The Assessment Item Sampler is in no way a predictor of the test taker's ability to perform on the actual Standards Based Assessments, nor are the questions the same as those on the actual test. The questions on the item sampler reflect the type of questions one might see on the actual assessment. The length of the item sampler does not reflect the amount of time it will take for a student to complete the actual Standards Based Assessments. The purpose of the sampler is to help teachers become familiar with the Standards Based Assessments and give them a tool to use with students as they prepare for the assessment.

Additional copies of the Assessment Item Sampler can be downloaded from the Alaska Department of Education & Early Development Web site by going to <http://www.eed.state.ak.us/tls/assessment/sba.html>.

Read the passage about the possibility of sounds coming from the northern lights. Then, answer the questions that follow.

The Mystery of Auroral Sounds

by Daniel Hudon

For years, people have reported hearing sounds when they see dazzling displays of northern lights. Compared to the tens of thousands of people who have witnessed these sky shows, the “earwitness” reports are rare: just a few hundred documented reports of auroral sounds, all heard during intense aurora displays.

Even so, the reported sounds have a lot in common: They appear to be coordinated with the lights, and both soft, crackling sounds and faint whistling or swishing sounds are heard. One observer said, “You think you hear the rustle of long green gowns of silk.” Others describe the sounds as being like whispering in the ear, the crinkling of plastic, or the slow *wubble-wrang-wubble-wub* of a piece of metal flexing. Strangely, veteran aurora observers, including some scientists, have heard the sounds only once or twice in their lifetimes. There’s only one problem with all these sound reports: They shouldn’t exist!

Auroral displays typically originate above 90 kilometers in the atmosphere, about nine times higher than a 747 jet typically flies. At this altitude, the atmosphere is too thin for sound waves to travel through it. Even if sound waves were somehow created high in the atmosphere, they would take five minutes or longer to travel down to the ground. Just as a rumble of thunder is heard several seconds after a distant bolt of

lightning is seen, auroral sounds, if they are real, would be expected to lag behind the visual display.

So why do observers report that the two occur at the same time? And, why will one observer report hearing sounds while another standing only a few feet away hears nothing?

This mystery has caused many scientists to doubt that auroral sounds are real. In fact, some scientists have tried to explain them as a psychological effect: Because observers expect sounds to be associated with dazzling visual displays, such as special effects in science-fiction movies, or real-life fireworks, they imagine the sounds that they expect to hear.

Another part of the mystery is that attempts to record the sounds with a microphone and tape recorder have failed.

But suppose the sounds are real? What could be the cause?

Auroras themselves are caused by energetic particles from the sun zipping down Earth’s magnetic field lines and colliding with atoms in Earth’s atmosphere. These collisions excite the atoms, causing them to create electromagnetic waves—light—that we see as the aurora.

The bombardment of Earth’s atmosphere by charged solar particles also produces low-frequency radio waves. Unlike acoustic waves (for example, from

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a clap of thunder or clapping your hands), which travel at the relatively slow speed of sound, radio waves whiz along at the speed of light.

While some scientists think that the sounds are created by static electricity during the auroral storm, Colin Keay, an Australian physicist, thinks that radio waves provide the solution. In his theory, the radio waves travel to Earth's surface, where they transfer their energy into acoustic waves with the help of nearby objects that act as "receivers." These "receivers" could be blades of grass,

pine needles, leaves, or even a person's hair. When they begin vibrating, acoustic sounds are heard. This also would explain why one observer hears something while another hears nothing: The first happens to be closer to the particular "receiver."

Scientists have recorded these radio waves for decades, using radio equipment. But a recording of the sound waves produced by these radio waves has yet to be made. Until a tape recording is made, auroral sounds will continue to be one of the mysteries of the northern lights.

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Reporting Category: Forming a General Understanding
Grade Level Expectation: 4.3.2

1. What causes the auroras to occur?
 - A Acoustic waves hit receivers to make them visible.
 - B Static electricity during storms causes waves to hit charged particles.
 - C Radio waves in space travel to the earth's surface at the speed of light.
 - D Energetic particles from the sun collide with atoms in Earth's magnetic field.

Reporting Category: Forming a General Understanding
Grade Level Expectation: 4.2.1

2. The scientists who think that these sounds are a "psychological effect" think that
 - A people are imagining the sounds.
 - B the sounds can be heard when a person is alone.
 - C waves bouncing off a person's hair cause the sounds.
 - D the earth's magnetic field causes people to hear the sounds.

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Reporting Category: Word Identification Skills

Grade Level Expectation: 4.1.4

3. As used in the passage, the word acoustic refers to which type of waves?
- A light
 - B sound
 - C radio
 - D magnetic

Reporting Category: Forming a General Understanding

Grade Level Expectation: 4.2.2

4. With which statement would scientist Colin Keay most likely agree?
- A The auroral sounds come from an active imagination.
 - B The auroral sounds can only be heard by certain people.
 - C We can learn more about auroral sounds by studying radio waves.
 - D We can experience this phenomenon maybe once or twice in a lifetime.

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Reporting Category: Forming a General Understanding

Grade Level Expectation: 4.2.2

Short Constructed Response (2 points)

5. Use two examples from the passage to explain why it is hard to prove the existence of auroral sounds.

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