

1. While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

Question 1

Scoring Guide

Score & Description
<p>Complete</p> <p>Student demonstrates understanding of the transmission, reflection, and absorption of sound. The response mentions that the sound is reflected or bounced off the walls and/or empty seats the first time the student shouts and that the audience absorbs the sound the second time.</p>
<p>Partial</p> <p>Student response mentions only the reflection or bouncing of sound off the walls and/or empty seats the first time the student shouts.</p> <p>OR</p> <p>Student response mentions only the absorption of the sound by the audience the second time the student shouts.</p>
<p>Unsatisfactory/Incorrect</p> <p>Student response demonstrates no understanding of the reflection of sound off the walls and seats of the auditorium the first time the student shouts, and no understanding of the absorption of the sound by the audience the second time.</p>

Complete - Student Response

- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

The first time she shouted, the wall reflected the sound, but the second time she shouted, all the people absorbed the sound before it hit the wall

Scorer Comments:

Student response mentions the wall reflecting the sound the first time the student shouts and the people absorbing the sound the second time.

- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and

why she does not hear an echo the second time.

The first time her voice bounced off the smooth walls and floor making an echo. The second time her voice was absorbed by the people so no echo was produced

Scorer Comments:

Student response mentions student's voice bouncing off the smooth walls to make an echo the first time and being absorbed by the people the second time.

Partial - Student Response

- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

The first time the auditorium is empty so the sound waves have plenty of room to bounce off the wall and come back to her.

Scorer Comments:

Student response mentions sound waves bouncing off the walls of the empty auditorium the first time, but makes no mention of people absorbing the sound the second time.

- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

because the sound is being absorbed by all the people

Scorer Comments:

Student response mentions people absorbing the sound the second time the student shouts, but makes no mention of sound waves bouncing off the walls the first time.

Unsatisfactory/Incorrect - Student Response

- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

Because when no one is in the room, sound travels more frequently.

Scorer Comments:

Student response provides an incorrect explanation of what happens the first time the student shouts, and makes no mention of the second time.

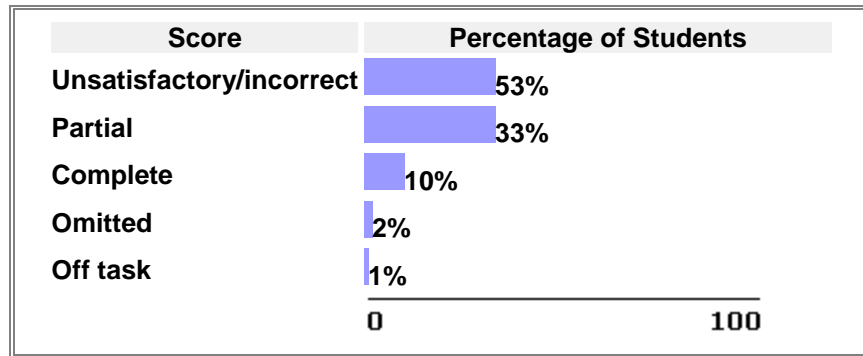
- 1 While practicing for a play, a student standing on the stage of a large, empty auditorium shouts loudly and hears her voice echo throughout the room. Later, the same student is on the stage of the same auditorium, which is now full of quiet people. The student shouts again, just as loudly. This time, however, she does not hear an echo. Explain why she hears an echo the first time and why she does not hear an echo the second time.

because her voice echo throughout the room. This second time however she does not hear an echo.

Scorer Comments:

Student response paraphrases the question without adding any explanation.

2000 National Performance Results



Note:

- These results are for public and nonpublic school students.
- Percentages may not add to 100 due to rounding.

The Fields of Science: *Physical Sciences* (Sub content classification: *Motion*)
Knowing and Doing Science : *Conceptual Understanding*

The Fields of Science

Physical Sciences

This question measures basic knowledge and understanding of the following:

Knowing and Doing Science

Conceptual Understanding

Conceptual understanding includes the body of scientific knowledge that students draw upon when conducting a scientific investigation or engaging in practical reasoning. Essential scientific concepts involve a variety of information, including facts and events the student learns from both science instruction and experiences with natural environment; and scientific concepts, principles, laws, and theories that scientists use to explain and predict observations of the natural world.