SCILLSS Classroom Science Assessment Workshop

# Example Grade 8 Science Unit Quiz

**Grade:** Middle School

**NGSS Performance Expectation: MS-PS4-2.** Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

## Task

This task is about sound waves.

1. Sound does *not* travel through
   1. water
   2. steel rails
   3. wooden doors
   4. outer space

*Use the table to answer questions 2–4.*

|  |  |
| --- | --- |
| **Substance** | **Speed of Sound (m/s)** |
| Rubber | 60 |
| Air (0° C) | 330 |
| Air (25° C) | 346 |
| Water (25° C) | 1,498 |
| Wood (oak) | 3,850 |
| Glass | 4,540 |
| Steel | 5,200 |

1. What information does the table provide?
   1. the speed of sound in different states of the same matter
   2. the speed of sound at several different temperatures
   3. the speed of sound of different distances
   4. the speed of sound in different substances
2. In which substance does sound travel most slowly?
   1. rubber
   2. steel
   3. air
   4. water
3. Sound travels faster through air at 25° C than it does at 0° C. This shows that sound travels
   1. only at temperatures above 0° C
   2. faster at lower temperatures
   3. more slowly at lower temperatures
   4. more slowly at higher temperatures
4. A substance through which a wave can travel is a \_\_\_\_\_\_\_\_.
5. When a drum vibrates, the air molecules that begin vibrating next to it do not reach your ear, yet you hear the sound of the drum. Explain.

*Use the scenario below to answer questions 7 and 8.*

Ann is a sound engineer. She is developing a material to keep outside noises from disrupting the recording of music in a studio. Noise is unwanted sound and happens when sound is not absorbed by anything and reflects off of walls or other materials. Most of Ann’s experience is in the field of sound absorption. This phenomenon is exactly what it sounds like, taking incoming sound and absorbing it to achieve silence.

Sound waves will do one of two things when they encounter an object, they can be absorbed, or they can be reflected. When sound is reflected, it is sent back into the room. When a sound-absorbing material absorbs it, it turns into a small amount of heat energy.

1. How can something like soft, bonded cotton, or a layer of foam provide sound absorption, while a pane of solid glass does not absorb it as well?
2. Describe an example of a reflected sound wave and how the phenomena may be applied.

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