**Subject area/course**: Science/Physics

**Grade level/band**: 10-11

**Task source**: Summit Public Schools

**Wave/Sound CER (Claim Evidence Reasoning) Essay**

**STUDENT INSTRUCTIONS**

1. **Task context**:

For many, sound is a vital part of your everyday existence. We communicate through sound, we perceive the world around us, and entertain ourselves with music. This is all made possible by the transmission of sound waves. But what is sound? How does the sound even get to your ears? How is the sound from your mp3 player produced?

Light is essential to life on this planet. Light from the sun is the source of all energy on this planet. And light is vital for everything that we are able to see. We use it to send signals, to heat food, to see everything around us. But what is light? How do you perceive different colors?

1. **Final product**:

In this task you will perform an investigation to determine if sound or light is a mechanical wave. To accomplish this, you will:

1. Determine the criteria for what makes something a mechanical wave.
2. Participate in an exploratory lab to collect evidence on the nature of sound/light.
3. Design an experiment to further support your finding about the nature of sound or light.
4. Make recommendations for a material to be used as a sound barrier based on your understanding of the transmission of sound. Develop a model of how your device will work. Alternatively, you can develop a model to show how light interacts with a barrier.
5. Use knowledge gathered during your investigation along with research from reputable sources to write a paper detailing the development of your model using evidence about the nature of sound or light to support the model’s validity.
6. Write a five paragraph persuasive essay to support your claim.
7. Go through a feedback and revision cycle to turn in the highest quality project imaginable.

**Additional Information**

1. **Knowledge and skills you will need to demonstrate on this task:**
2. **On this task, you will show that you know these things:**

* Identify what constitutes a mechanical wave
* Investigate experimentally characteristics of light or sound
* Develop a model of sound or light interacting with another medium
* Apply your knowledge of light or sound in a persuasive essay

1. **On this task, you will show that you are able to do these things:**

* Design an investigation to confirm your findings about sound or light
* Model light or sound and its interactions with other media
* Synthesize and evaluate your experimental evidence to draw conclusions about the nature of light or sound
* Prepare a paper that details your findings and recommendations and correctly cite your sources
* Provide constructive feedback to your peers on their draft papers and take into consideration feedback they provide you
* Communicate your conclusions from experimentation clearly using evidence to support your conclusions in a way that will engage the reader

1. **Materials needed:**

Documents:

* Item A. Is Sound a Mechanical Wave?
* Item B. Sound Stations OR
* Item C. Light Stations
* Item D. Stations Graphic Organizer
* Item E. Outlining your Argument
* Item F. Peer Editing Worksheet

1. **Time requirements:**

This task will take approximately 1-2 weeks to complete. Your teacher will provide additional details.

1. **Scoring:**

Your work will be scored using the Wave/Sound CER Essay rubric. You should make sure you are familiar with the language that describes the expectations for proficient performance.