Name_____

Task- Demonstrate mastery of **AMPLITUDE** in terms of wave speed, wavelength, energy, and frequency as it travels through different mediums (hot and cold air) and show how that affects the sound that you hear.

Phenomenon

https://www.youtube.com/watch?v=KPc7G-WJQ7Y

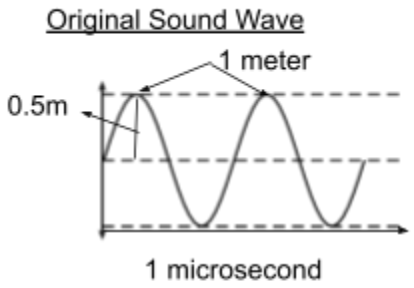
Imagine Dragons video (if you can't watch just imagine- The Imagine dragons are playing live on the ice in a hockey stadium.)

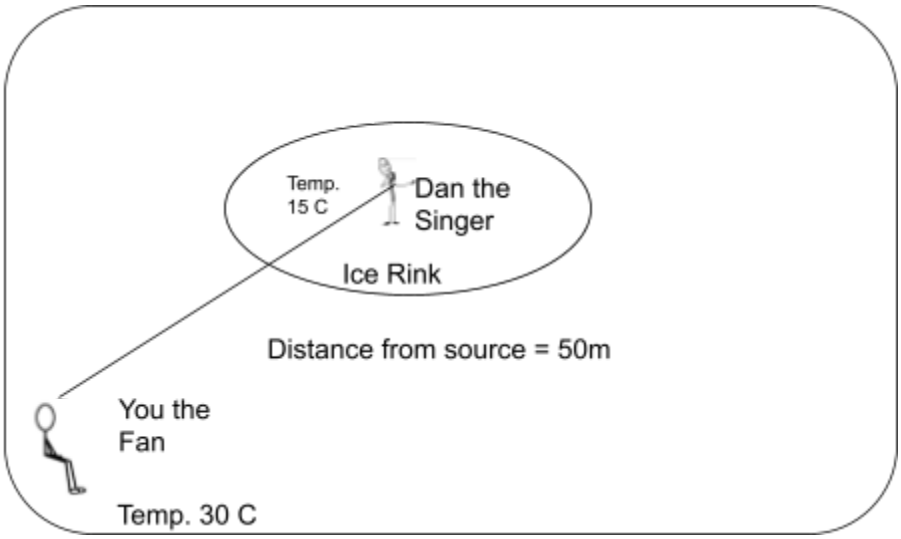
Stimulus

Your favorite band is playing a concert-okay my favorite. Dan is performing on the ice in the middle of the Hockey stands. It is cold down there-15 C. . You are sitting way up the back, where the seats are cheap, and the air is hot from rising molecules. You are 50 meters away from the band and positioned 10 meters above them.

Air temp (˚c)	Speed of sound (m/s)
15	340
20	342
25	345
30	348

Sound wave at origin:





Prompt
Using mathematical reasoning and your understanding of waves: 1. Draw the wave on the provided graph when it reaches your area to represent the effect of distance on the wave. 2. Three students were discussing the effect of the distance on the sound they hear when it reaches the back. a. Barbara says, “you will hear softer sounds than those upfront because you are further away.” b. Kathy says “I think you will hear softer sounds but they are refracted up so they will be louder and than if you were lower in the stands” c. Carlos claims “I agree that the sound will be much softer than other places because the sound will refract down and our distance is greater.” Which student do you agree with or are they all wrong, explain your reasoning using mathematical reasoning and your understanding of waves:

Who do you agree with? Barbara. Kathy, Carlos or no one.

_____

Explain why with a **graph**- showing evidence that you are correct. Must show how the wave changes with each medium.

Graph(s)

Now explain with words **and** mathematical equations who is correct and why. Write 3-7 sentences explaining why you are correct. Justify with evidence and reasoning.

Grading- 20points				
	5points			0 points
Correct Graph(s)	Shows relationships with pitch, wavelength, frequency, and/or wave speed in a graph			Did not attempt
Communication	Writes in clear complete sentences following a well developed thought			Did not attempt
Correct mathematical explanation	Explains using the equation velocity = frequency times wavelength.			Did not attempt
Use of Sound Wave Physics	Correctly identifies aspects of the wave that are affected by temperature.			Did not attempt