Name: Date: Class Period

Speed of Light vs. Speed of Sound

Speed of sound vs. speed of light

https://youtu.be/gwMlwcIRG1Y

Before you start watching the video make a guess. Do you think that sound or light will travel faster? Explain your reasoning.

_____

_____

_____

Now watch the video up to 3:44

Draw a picture that shows the experimental setup that was used to test whether the speed of light or speed of sound was faster. Make sure you add some descriptions such as how the light/sound device worked. Label the different distances the device was tested at.

Does light energy or sound energy travel faster? _____

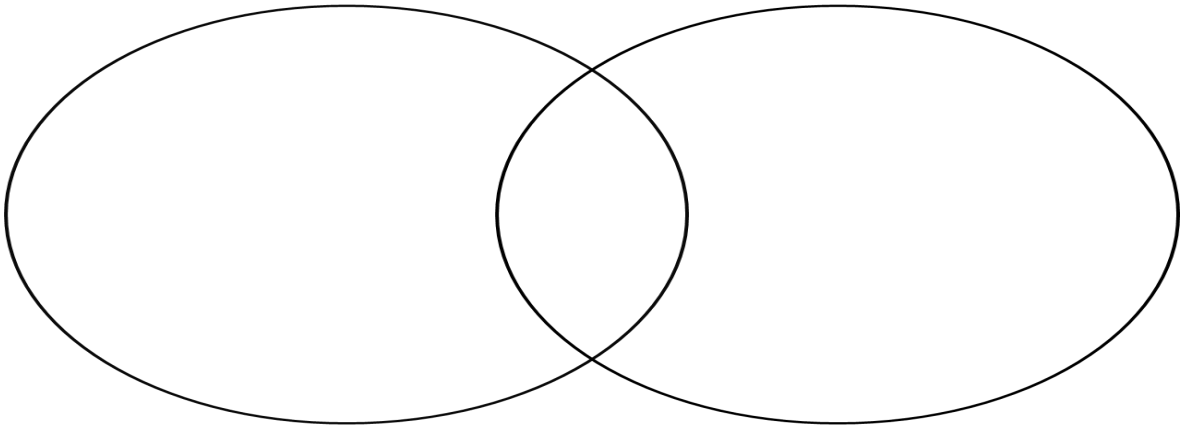
Student Notes: Take these notes while you watch the rest of the video. 3:45-End

Light is an electromagnetic wave that travels at a speed of almost _____ million meters per second. Light could go around planet earth _____ times in a second. Light also has the unique ability to travel through the emptiness of _____. That is really important because without it _____ on earth would cease to exist. Sound on the other hand is what is called a mechanical _____. It requires a _____ or something to travel through. In the case of this experiment, the medium was the air. In the air sound travels at a speed of _____ meters per second. It would take sound _____ hours to travel once around the earth! The medium that sound travels through doesn't have to be a gas - like the air in our

experiment. It could be a _____ - you might have heard a sound when swimming underwater in a pool - or it could be a _____. If you tap on a brick wall the sound travels through the solid bricks. The characteristics of a particular medium affect the _____ of sound. On a warm day sound will travel at a _____ speed than on a cold day.

Complete the venn diagram comparing and contrasting light and sound waves.

Light Waves Sound Waves



Questions:

1. Scientists have calculated that the fastest sound can travel (in an extremely dense material like solid atomic hydrogen) is 36,000 meters per second. In this super dense material would sound be able to compete with the speed of light? Explain.

   _____

   _____

2. The sun is about 149,600,000,000 meters away from earth. Calculate how long it would take sunlight to reach earth? _____
3. How long should it take **sound** to reach an observer who is 800 meters away from the source? _____
4. Go back and watch the final test in the experiment (800 meters). Use a timer or stopwatch to record the time between the light and sound arrival. Now record the time here _____. Was the time it took for the sound to arrive at the observer about what you would expect? Explain.

   _____

   _____

*Challenge: How long would it take **light** to travel 800 meters? _____
Show your work in the space below: