PHYSICS IN MOTION
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Unit 6B
Sound Waves
Speed of Sound in Air Lab

Name:

Date:

In today's activity, you will be experimentally determining the speed of sound in air.

Materials:

- timer
- measuring tape
- wood blocks
- thermometer

Procedure:

- Have a student stand on one goal line of the football field with wood blocks, and another student stand on the opposite goal line with a timer.

- The student should clap the wood blocks together so that the student with the timer can see when they are struck, and measure the time it takes for the sound to reach them.

- Conduct multiple trials to get a more accurate measurement.

Data and Analysis:

Temperature of Air = _____

Calculate the actual speed of sound in air:

$$v_{sound} = 331 \, ^m/_s + (0.6 \, ^m/_{s°c})(Temperature)$$

Distance between students = _____

If you are on each goal line, that is 100 yards apart. Convert to meters!

Time (s):

Trial 1 = _____

Trial 2 = _____

Trial 3 = _____

Average Time = _____

Using the constant speed equation, determine the experimental speed of sound:

Find the percent error of the speed of sound between your experimental value and the actual value:

$$percent\ error = \frac{actual\ value - experimental\ value}{actual\ value} \times 100\%$$

Questions to consider:

1. Why is there a delay between when you see the wood blocks hit together and when the sound reaches your ear?

_____

_____

2. What were potential sources of error in your measurements?

_____

3. Do you feel your results would have been improved if your distance was changed, either closer or further apart? Explain why.

_____

_____

_____

4. How would the time it took the sound to travel change had the temperature been warmer? Colder?

_____

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