

H19.

- (a) Briefly outline an experiment Susan could do at her school, using echos on the playground wall to measure the speed of sound. Indicate what materials Susan would need, what measurements she will take, and what computations she will make.
- (b) Four teams in Susan's class did the experiment you described. Each team got a different answer. Explain one reason why this might happen.

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Part a

Subject	Item Key	Content Category	Performance Expectation	International Average Percent of Students Responding Correctly	International Difficulty Index
Physics	next page	Wave Phenomena	Investigating the Natural World	19%	747

# H-19a Coding Guide

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## A: Outline of Experiment

**Note:** There are two variables for this item, one for each question, A and B.

Part A: Responses to this item should include the following three aspects:

- i) Materials needed
- ii) Description of the measurements of the distance and time.
- iii) computation:  $\text{Speed} = \text{distance}/\text{time}$  (includes factor of 2x distance from source to wall)

Code	Response
<b>Correct Response</b>	
20	Response makes some reference to all three aspects, i, ii, iii.
29	Other acceptable responses such as using interference phenomena.
<b>Partial Response</b>	
10	Refers to two of the aspects, omits i.
11	Refers to two of the aspects, omits ii.
12	Refers to two of the aspects, omits iii.
13	Refers to all three aspects but with error in c, such as inconsistency, or a factor of 2 error in distance or time.
19	Other partially correct responses.
<b>Incorrect Response</b>	
70	Two of the aspects not adequately described.
79	Other unacceptable responses.
<b>Nonresponse</b>	
90	Crossed-out/erased, illegible, or impossible to interpret.
99	BLANK