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The Physics 500

Purpose

To compute the average speed of at least three different races and to participate in at least one race

Required Equipment/Supplies

meterstick
stopwatch
string
equipment brought by students for their races

Discussion

In this activity, you will need to think about what measurements are necessary to make in order to compute the average speed of an object. How does the average speed you compute compare with the maximum speed? How could you find the maximum speed of a runner or a car between stoplights?

Procedure



Step 1: Work in groups of about three students. Select instruments to measure distance and time. Develop a plan that will enable you to determine speed. Two students race each other in races such as hopping on one foot, rolling on the lawn, or walking backward. The third student collects and organizes data to determine the average speed of each racer. Repeat this process until each member of your group has a chance to be the timer. For the race in which you are the timer, record your plan and the type of race.

Measure average speed.

When measurements are to be made in an experiment, a good experimenter organizes a table showing *all* data, not just the data that “seem to be right.” Record your data in Data Table A. Show the units you used as well as the quantities. For each measurement, record as many digits as you can read directly from the measuring instrument, plus one estimated digit. Then calculate the average speed for each student.

Activity	Distance	Time	Speed

Data Table A

Compute unknown distance.

Step 2: Upon completing Step 1, report to your teacher. Your teacher will then ask you to perform one of your events over an **unknown distance**. Then, compute the distance covered (such as the distance across the amphitheater or the length of a corridor), using the average speed from Step 1.

event: _____

average speed = _____

distance = _____

Analysis

1. How does average speed relate to the distance covered and the time taken for travel?

2. Should the recorded average speed represent the maximum speed for each event? Explain.

3. Which event had the greatest average speed in the class in miles per hour ($1.00 \text{ m/s} = 2.24 \text{ mi/h}$)?

4. Does your measurement technique for speed enable you to measure the fastest speed attained during an event?
