

# Physics 500

**Purpose:** *to get out of the classroom and gather real data in order to analyze speed through calculations and graphing*

## **Get Ready, Set, Race!**

*Step 1: Get your materials!*

The class needs 16 metersticks, 12 stopwatches, five cones

*Step 2: Set-up your "race" track!*

Measure off a 16 meter race track. Use 5 cones to mark off every 4 meters of your track (0 m, 4 m, 8 m, 12 m, and 16 m).

At each cone: You will need 3 students with stopwatches (timers need to record the time it takes for their racer to get from the start to their cone.)

One student at each cone with a class data table to record all the times of the racers.

*Step 3: Race!*

Each person will need to participate in one "race" of three people at a time: you may hop, walk backwards, walk at a regular rate, or speed walk.

## **Collect That Data!**

Once back in the room each student will need to look on each data table from the timers in order to complete the data table below with his/her data plus two other group members.

<b>Name</b>	<b>4 m</b>	<b>8 m</b>	<b>12 m</b>	<b>16 m</b>

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## Analyze it!

1. Calculate your average speed for the 16 m race. Show your work.
2. Which group member had the fastest average speed? the slowest average speed?
3. How did you determine the which person was fastest?
4. Construct a **distance v. time graph** for your data as well as two other group members on the same graph. Use the slowest racer to set your time scale.
5. How does the graph show which racer was the fastest and slowest?
6. Did each racer race at a consistent speed? How does the graph show this?
7. During which interval did you race the fastest? Why do you think this was your fastest interval?
8. How long would it take you to complete 1600 meters (4 laps around a track) based on your average speed? Explain how you came up with your answer.
9. Do you really think you could complete 4 laps in the time you predicted? Explain.
10. Based on the setup of this activity, identify the independent and dependent variables. Why do you think the graph is not setup based on these variables?