

PHYSICAL SCIENCE MINILAB – SPEED/VELOCITY

Mr. Menin

NAME/SECTION _____

- Goals:** A. To continue the development of your understanding of “speed/velocity”.
 B. To continue in our practice of the use of SI & English units.

PART I: CALCULATING SPEED

1. If you drive 200 miles in 4 hours, your speed is _____.
2. If you drive 170 miles in 3 hours, your speed is _____.
3. If you run 40 yards in 4 seconds, your speed is _____.
4. If you run 800 meters in 119 seconds, your speed is _____.

PART II: LAB – FINDING A PERSON’S WALKING SPEED IN SI UNITS

5. Get a stopwatch.
6. Your job is to figure out a person’s walking **speed, IN ENGLISH & SI UNITS**. A ready conversion of SI to ENGLISH is the fact that there are 2.54 cm per inch. Use this relationship to calculate the conversion factor of feet per meter. Show your work and write your conversion factor here. (*1 Foot = _____ meters or 1 meter = _____ feet.*)
7. This means you will have to measure off a certain distance (*I suggest you start with the English system and use the floor tiles as a measuring standard – then convert to the SI system. Why?*). Then one of you will walk and the other will time. We will do this in the hall such that we shouldn’t have to move tables to clear a path.
8. To get good results you should walk at least 5 meters (~16 feet).
9. Show your results here:

Measurements:

Distance: _____ m Time: _____ s

Distance: _____ ft Time: _____ s

Calculation:

Walking Speed = _____ (*Be sure to get the units right.*)

Convert this to miles per hour.

10. Check your results by repeating the experiment and making sure that the answer is about the same.

Measurements:

Distance: _____ m Time: _____ s

Calculation:

Walking Speed = _____ (Be sure to get the units right.)

11. Now check your results by **comparing** them with at least 2 other people in your lab group:

First Partner: Names: _____ Their speed: _____

Second Partner: Names: _____ Their speed: _____

Are your results similar to other people? _____ If not, is this readily understandable.

INTERMISSION => Calculation of your average pace length.

Walk a fixed number of paces (*10 or greater*) at your regular stride and measure the distance traveled (*e.g. number of tiles*). Divide the distance by the number of paces to calculate your pace in “feet” and in “meters”.

a. My pace = _____ feet or _____ meters.

Repeat this two more times and average the three readings.

b. My pace = _____ feet or _____ meters.

c. My pace = _____ feet or _____ meters.

My average pace = _____ feet or _____ meters.

Record these numbers both here and elsewhere in your notes for ready reference.

PART III: ESTIMATING

12. The experiment is finished. Now that you know how fast a person walks, you can **estimate** the speed of other things.

FACT: The **top** speed for a person is about 12 m/s.

13. **Estimate** the speed, **in SI units**, of a person jogging and explain why you selected that number.

14. **Estimate** the speed, **in SI units**, of a bike going very fast and explain why you selected that number..

PART IV: A FORMULA FOR SPEED

15. Think about how you figured out “speed”. You had to measure distance and time. Write out your calculation method as an equation using the words “distance” and “time”?

SPEED =

How does speed differ from velocity?

16. In Physics we use letters to stand for words. “v” means “speed.” “d” means “distance.” “t” means “time.” Now write the same equation that is in #15, but use the letters in place of the words:
