

Distance, Time, Speed

d – *distance* travelled

v – average *speed*

$$v = \frac{d}{\Delta t}$$

$\Delta t = t_{final} - t_{initial}$ – travel *time*
 Δ (Delta) stands for “change”

| Physical Quantity | Standard Units (metric system) | Other Units |
|--------------------------|-----------------------------------|---|
| Length, distance (d) | meter (m) | kilometer: 1km = 1000m centimeter: 1cm = 0.01 m 1 mile \approx 1.6 km; 1ft \approx 0.3m; 1inch \approx 2.5 cm |
| Time (t) | second (s) | hour: 1hr = 3600 s |
| Speed (s) | m/s | km/hr, mile/hr (mph) cm/s, km/s..... |

Homework 2

Problem 1. Below is the schedule of “*Acela*” train that runs from Washington DC to New York City:

| | |
|------------------------------|----------------|
| Washington (0 mi) | 5:00 am |
| Baltimore (41 mi) | 5:30 am |
| Philadelphia (135 mi) | 6:30 am |
| New York (226 mi) | 7:42 am |



Find the average speed (in miles per hour, mph) for each of the three segments, and for the whole trip. Convert your results first to km/hr, and then to meters per second (m/s):

| Segment | Speed (mph) | Speed (km/hr) | Speed (m/s) |
|------------------------|-------------|---------------|-------------|
| Washington-Baltimore | | | |
| Baltimore-Philadelphia | | | |
| Philadelphia-NYC | | | |
| Washington-NYC | | | |

Problem 2. Measure speed of a moving object (toy, rain drop on a window, a pet...). Sketch your experiment, record your data and compute the result (both in the units in which you made your measurements, and in m/s).