

# Distance, Time, Speed

*d* – **distance** travelled

*v* – average **speed**

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

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

Physical Quantity	Standard Units (metric system)	Other Units
Length, distance ( <b>d</b> )	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 ( <b>t</b> )	second (s)	hour: 1hr = 3600 s
Speed ( <b>s</b> )	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:

<b>Washington (0 mi)</b>	<b>5:00 am</b>
<b>Baltimore (41 mi)</b>	<b>5:30 am</b>
<b>Philadelphia (135 mi)</b>	<b>6:30 am</b>
<b>New York (226 mi)</b>	<b>7:42 am</b>



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).

**Problem 3.** Let us finally settle the question, who is faster - a snail or a sloth. I did some serious research! Let me first give you a quote from a news article about World Snail Racing Championship (yes, that's a thing!). "The 2019 championships were held on 20th July 2019 and this year's winner was a snail called Sammy owned by Maria Welby from Grantham, Lincolnshire. Sammy covered the 13 inch course in 2 mins 38 secs." As for the sloths, they hold the Guinness Record as the slowest mammal and an article on [guinnessworldrecords.com](http://guinnessworldrecords.com) claims "While on the ground, three-toed sloths travel at just 1.8–2.4 m (6–8 ft) per min". Would a sloth become the winner in World Snail Racing Championship (if admitted as a guest competitor)? Recalculate the speed of both species into the same units to justify your answer.