

## Calculating speed

### Speed is distance divided by time

Speed is a measure of the *distance* traveled in a given amount of *time*. You calculate speed by dividing the distance traveled by the time taken. For example, if you drive 150 kilometers in 1.5 hours, then the speed of the car is 150 kilometers divided by 1.5 hours or 100 kilometers per hour (Figure 12.7). The speed found by dividing the total distance by the total time is the **average speed**. A car speeds up and slows down during a trip as it moves up and down hills, gets stuck in traffic, and reaches intersections. When talking about speed, we usually mean the average speed over a certain time period.

### What does “per” mean?

The word “per” means “for every” or “for each.” The speed of 100 kilometers per hour is short for saying 100 kilometers *for each* hour. You can also think of “per” as meaning “divided by.” The quantity before the word per is divided by the quantity after it. For example, 150 kilometers divided by 1.5 hours (or per every 1.5 hours) equals 100 kilometers per hour.

### Units for speed

Since speed is a ratio of distance over time, the units for speed are a ratio of distance units over time units. In the metric system, distance is measured in centimeters, meters, or kilometers. If distance is in kilometers and time in hours, then speed is expressed in kilometers per hour (km/h). Other metric units for speed are centimeters per second (cm/s) and meters per second (m/s). Speed is also commonly expressed in miles per hour (mph). Table 12.1 shows different units commonly used for speed.

Table 12.1: Common units for speed

Distance	Time	Speed	Abbreviation
meters	seconds	meters per second	m/s
kilometers	hours	kilometers per hour	km/h
centimeters	seconds	centimeters per second	cm/s
miles	hours	miles per hour	mph
feet	minutes	feet per minute	ft/min, fpm

## VOCABULARY

**average speed** - the total distance divided by the total time for a trip.



Figure 12.7: A driving trip with an average speed of 100 km/h