

# Speed, Distance, Time

**Distance ( $d$ )** is the amount of space between two objects or points.

The common unit of distance is the metre (m) it can also be represented as m,cm,mm,km etc

**Time** - is the duration between two events

Is measured in seconds (s) , minutes (min) or hours (h)

What is the relationship between Distance and Time?

The answer is **speed**

$$\text{Speed} = \frac{\text{distance}}{\text{Time}} = \frac{d}{t}$$

represented as km/h , m/s etc

There are various ways we can describe speed

Instantaneous Speed  
Constant Speed  
Average Speed

## Instantaneous Speed

is the speed at which an object is travelling at a particular instant.

i.e. if a car is stopped at a stop light its instantaneous speed is 0km/h

when a car passed a truck its speed was 100km/h at that specific point in time.

## Constant Speed

if instantaneous speed remains the same over a period of time we say the car is travelling at a constant speed. If you are using cruise control on your car it is easy to travel at a constant speed.

## Average Speed ( $v_{av}$ )

= it is the total distance (d) divided by the total time (t) of the trip.

Formula :  $v = \frac{\Delta d}{\Delta t} = \frac{d_2 - d_1}{t_2 - t_1}$

use  $d_2 - d_1$  or  $t_2 - t_1$  when you have more than one distance or more than one velocity

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

We will use  
 $d = vt$

$\Delta$  → Greek letter  
Delta  
→ Means  
"Change In"

Example 1: Jenny skates to school a distance of 4.5km. Her journey takes 0.62 h. What is her average speed during the trip?

$$d = 4.5 \text{ km}$$

$$t = 0.62 \text{ h}$$

$$v = ?$$

$$d = vt$$

$$4.5 \text{ km} = v (0.62 \text{ h})$$

$$\frac{4.5 \text{ km}}{0.62 \text{ h}} = v$$

$$\boxed{7.25 \frac{\text{km}}{\text{h}} = v}$$

**Example 2:**

Josh is trying to find his average speed when riding his bike. He travels a distance of 45 km and it takes his 2.3h, including slowing down for climbing hills. What is his average speed?

$$d = v \cdot t$$

$$d = 45 \text{ km}$$

$$t = 2.3 \text{ h}$$

$$45 \text{ km} = v (2.3 \text{ h})$$

$$\frac{45 \text{ km}}{2.3 \text{ h}} = v$$

$$19.56 \text{ km/h} = v$$

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## Attachments

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pg 349 3,4,6,7,9 answers.notebook