



# Speed and Distance

Speed is the distance you are travelling, divided by the length of time that it takes you to get there

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Similarly, we can rearrange this equation as

$$\text{Distance} = \text{Speed} \times \text{Time} \quad \text{and} \quad \text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

## Example

This chart describes the distance between four towns.

Distance (miles)	Oldville	Newville	Summertown	Wintertown
Oldville	0	15	23	70
Newville	15	0	12	84
Summertown	23	12	0	56
Wintertown	70	84	56	0

- (i) What average speed must a car be driven in order to travel from Oldville to Wintertown in one hour?

According to the chart, the distance between Oldville and Wintertown is 70 miles. To cover this distance in one hour, the car therefore needs to be driven at an average speed of 70 miles per hour.

- (ii) Mr Byrne lives in Wintertown and would like to be in Newville by 3pm. He drives at an average speed of 56mph. What time should he leave Wintertown at?

Wintertown is 84 miles from Newville. Using the equations above, we have

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{84}{56} = 1.5$$

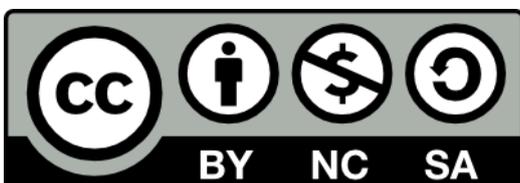
The journey will therefore take 1.5 hours or 60 x 1.5 = 90 minutes.

Mr Byrne should therefore leave Wintertown at 1.30pm.

Note

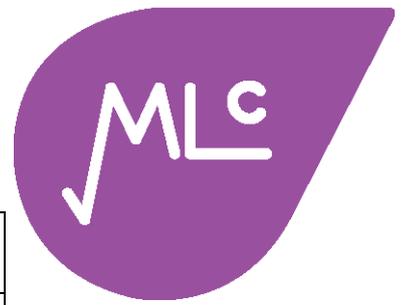
mph = miles per hour

kph = kilometres per hour



**Author** Dr Eleanor Lingham  
De Montfort University

**Moderator** Dr Julie Crowley  
Cork Institute of Technology



### Example

Make	Fuel Consumption (miles to the gallon)	
	Motorway	City
Fjord	47	38
Folkswagen	52	41
Renno	39	23
Scado	25	10

- (i) Joshua's commute involves 25 miles of motorway driving and 6 miles of city driving each way. At £4.52 per gallon of fuel, what is the weekly cost (Mon-Fri) of his commute in a Volkswagen car?

The weekly distance travelled by Joshua is

Motorway  $25 \times 2 \times 5 = 250$  miles

City  $6 \times 2 \times 5 = 60$  miles

(This is because he commutes twice a day for five days).

To calculate fuel consumption, we divide the distance by the fuel consumption rate

Motorway  $250 \div 52 = 4.81$  gallons

City  $60 \div 41 = 1.46$  gallons

Joshua therefore uses  $4.81 + 1.46 = 6.27$  gallons of fuel on his commute every week.

We calculate the cost of this  $6.27 \times 4.52 = \text{£}28.34$

- (ii) This version of the Scado car is 15% more fuel efficient on motorways than its previous version. What was the previous version's fuel consumption rate on motorways?

We have that the current motorway fuel consumption rate for the Scado car is 115% of its previous version. Therefore, the previous rate must be  $25 \div 115\% = 21.7$  miles

Therefore the fuel consumption rate on motorways for the previous version of the Scado car was 21.7 miles to the gallon.



**Author** Dr Eleanor Lingham  
De Montfort University

**Moderator** Dr Julie Crowley  
Cork Institute of Technology