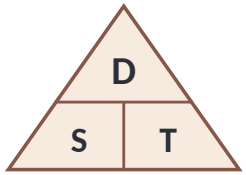
Speed: fact sheet

Planner week 11 · Learn these facts

The triangle



Cover the one you want

D = S × T

Speed

186 miles in 3 hours

186 ÷ 3 = 62 mph

Speed = distance ÷ time

Distance

58 mph for 4 hours

58 × 4 = 232 miles

Distance = speed × time

Time

143 miles at 55 mph

143 ÷ 55 = 2.6 hours

Time = distance ÷ speed

0.6 h = 36 min

Minutes and hours

45 min = 0.75 h

1 h 45 min = 1.75 h

0.6 h = 0.6 × 60 = 36 min

Divide minutes by 60

Never use 1.45 for 1 h 45

Average speed

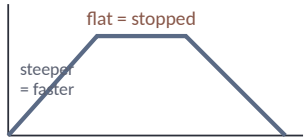
total distance

÷ total time

Add the parts first

Not the mean of the speeds

Travel graphs



Flat line: not moving

Speed = distance ÷ time

Units

mph	miles per hour
km/h	kilometres per hour
m/s	metres per second
m/s → km/h	× 3600 ÷ 1000

Which sheet do I need?

Speed, distance and time ▸
work out speed, distance or time

Travel graphs ▸
a distance-time graph

Key words

- **Speed** distance travelled each hour (or second)
- **Average speed** total distance ÷ total time
- **Travel graph** distance from home against time
- **Estimate** round to 1 s.f. first

Exam tips

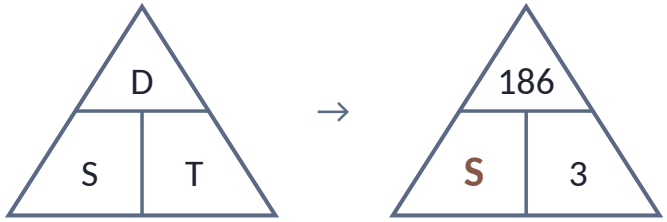
- Change minutes to hours: ÷ 60.
- Units must match: km with km/h, miles with mph.
- Average speed = **total** distance ÷ **total** time.
- Time answers in hours and minutes: 0.25 h = 15 min.
- Estimates: round each number to 1 s.f.
- Faster speed → less time. Say which way your answer changes.

Speed, distance and time: fact sheet

Speed · Planner week 11 · Work out which type it is, follow the example

1 SPEED is missing

Emily drives 186 miles in 3 hours. What is her average speed?

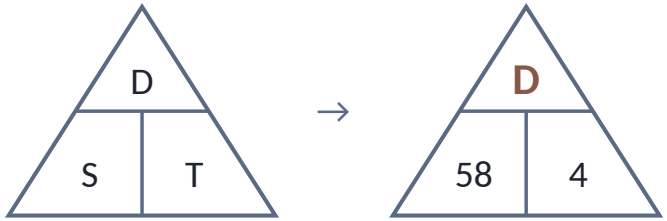


1. Know: distance and time
2. Fill in the triangle: **186** on top, **3** under T
3. Speed = distance ÷ time: 186 ÷ 3 = **62 mph**

Use this when: you know the distance and the time: 'average speed', 'how fast'

2 DISTANCE is missing

Sarah drives at an average speed of 58 mph for 4 hours. How far does she drive?

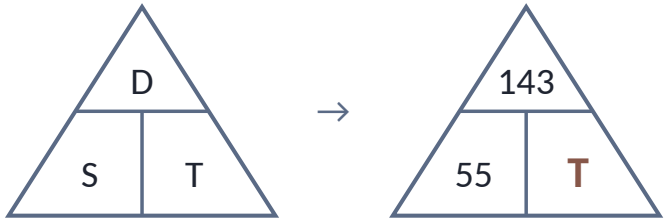


1. Know: speed and time
2. Fill in the triangle: **58** under S, **4** under T
3. Distance = speed × time: 58 × 4 = **232 miles**

Use this when: you know the speed and the time: 'how far'

3 TIME is missing

Riley travels 143 miles at an average speed of 55 mph. How long does it take?



1. Know: distance and speed
2. Fill in the triangle: **143** on top, **55** under S
3. Time = distance ÷ speed: 143 ÷ 55 = 2.6 hours
4. 0.6 × 60 = 36: **2 hours 36 minutes**

Use this when: you know the distance and the speed: 'how long', 'what time does it arrive'

The big question

Which two do I know, and which one is **missing**? Cover the missing one on the triangle.

Careful: change minutes to hours (÷ 60) before you start, and check the units match.

Watch out

- Writing 2.6 hours as 2 hours 60 minutes (0.6 × 60 = 36).
- Using 1.45 for 1 hour 45 minutes.
- Taking the mean of two speeds for an average speed.

Travel graphs: fact sheet

Speed · Planner week 11 · Learn the method

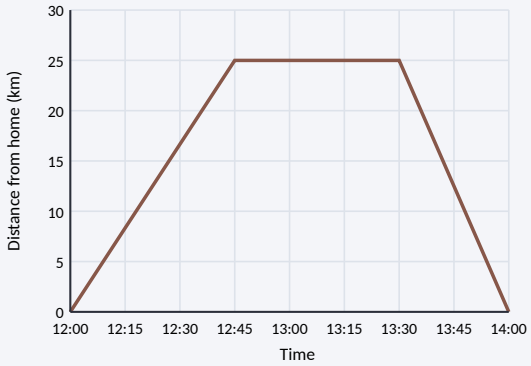
Worked example

QUESTION

Steve cycled from his home to a park. He stopped at the park, then cycled home.

The travel graph shows his journey.

(a) How long did Steve stop at the park? (b) Work out his speed on the way home.



ANSWER

1. (a) The flat part is when he stopped: 12:45 to 13:30 = 45 minutes
2. (b) He goes 25 km home in 30 minutes (13:30 to 14:00)
3. 30 minutes = 0.5 hours
4. Speed = 25 ÷ 0.5 = 50

(a) 45 minutes (b) 50 km/h

Flat means stopped. Speed = distance ÷ time.

How to do it

1. Read the scales: how many minutes is one small square?
2. Flat line: not moving. Read the start and end times.
3. Distance: the change on the up axis.
4. Time: the change on the across axis, in hours.
5. Speed = distance ÷ time. Steeper line = faster.

Model answer:

(a) 45 minutes (b) 50 km/h

Watch out

- Misreading the time scale.
- Using minutes, not hours, for km/h.
- Reading distance from home as distance travelled.