

## S1 Topic 10: Speed, Distance and Time

### 1) Calculate the average speed.

A train travels 189 miles in 3 hours. Calculate its average speed.

$$S = \frac{D}{T} = \frac{189}{3} = 63\text{mph}$$

### 2) Calculate the distance travelled.

A plane flies at 560 km/h for 6 hours. How far has it flown?

$$D = S \times T = 560 \times 6 = 3360\text{km}$$

### 3) Calculate how long a journey will take.

How long will it take a snail crawling at 1.2 metres per minute to cover a distance of 6m?

$$T = \frac{D}{S} = \frac{6}{1.2} = 5\text{minutes}$$

### 4) Learn to convert 15, 30 and 45 minutes to a decimal fraction of an hour

15 minutes =  $\frac{1}{4}$  hour = 0.25 hours

30 minutes =  $\frac{1}{2}$  hour = 0.5 hours

45 minutes =  $\frac{3}{4}$  hour = 0.75 hours

3 hours 45 minutes = 3.75 hours

2 hours 15 minutes = 2.25 hours

etc.

## 5) Carry out calculations using fractions of an hour

a) A car travels 14 miles in 15 minutes. Calculate its average speed in mph.

$$15 \text{ min} = 0.25 \text{ hours}$$

$$S = \frac{D}{T} = \frac{14}{0.25} = 56 \text{ mph}$$

b) A train travels at 84 km/h for 1 hour 45 minutes. How far does it travel?

$$1 \text{ hour } 45 \text{ min} = 1.75 \text{ hour}$$

$$\begin{aligned} D &= S \times T \\ &= 84 \times 1.75 \\ &= 147 \text{ km} \end{aligned}$$

c) How long does it take to travel 90 miles at 40mph?

$$T = \frac{D}{S} = \frac{90}{40} = 2.25 \text{ hours}$$

$$2.25 \text{ hours} = 2 \text{ h } 15 \text{ mins}$$

## 6) Success Criteria for speed, distance time calculations

- Identify relevant information in the question
- Decide which formula is needed to solve this problem
- Write out the formula then the calculation to be carried out
- Calculate the answer and write it down
- Remember to write down the correct units

## 7) Solve problems by finding speed, distance or time.

a) On a journey Amanda walks for 15 minutes at 4km/h to catch a bus. In the bus she travels for 45 minutes at an average speed of 40km/h. She then catches a train which travels at an average speed of 120km/h for 3 hours 30 minutes. How far has Amanda travelled altogether?

b) Jim cycled 33 miles in 3 hours. Jan cycled 39 miles in 3 hours 15 minutes. Who cycled with the higher average speed?

c) Mr Smith needs to be in Glasgow for a meeting at 11:00am. If he lives 65 miles from Glasgow and leaves home for the meeting at 9:45am, what average speed must he maintain to arrive in time?

**REMEMBER TO SHOW ALL YOUR WORKING  
AND EXPLAIN YOUR ANSWER FULLY!**