Average Speed — Multi-Stage Journey

Core Worksheet

Worked Examples & Guided Practice

I Do (Teacher Model) Sarah drives 60 km at an average speed of 40 km/h, and then drives a further 90 km at an average speed of 60 km/h. Calculate her average speed for the entire journey.

We Do (Guided Practice) James travels 80 miles in 2 hours and then 120 miles in 3 hours. Calculate his average speed for the entire journey.

You Do (Independent Practice) A train travels 45 km at 90 km/h and then a further 105 km at 70 km/h. Calculate the average speed for the whole journey.

Challenge (Extension) Alex drives 120 km from Town A to Town B at an average speed of 60 km/h. On the return journey, heavy traffic reduces his speed to 40 km/h. Show that his average speed for the whole round trip is 48 km/h.

Practice Perfect Questions

Q1. A car travels 100 km in 2 hours and then 150 km in 3 hours. Calculate the overall average speed.

Q2. A cyclist travels 20 km at 10 km/h and then 30 km at 15 km/h. Calculate total time and average speed.

Q3. A bus travels 15 miles at 30 mph, stops for 15 minutes, and then travels 25 miles at 50 mph. Calculate average speed including the stop.

Q4. A lorry covers 180 km: first 60 km at 30 km/h and remaining 120 km at 60 km/h. Find total average speed.

Q5. Ben runs 5 km at 10 km/h and walks 5 km at 5 km/h. Calculate his average speed.

Q6. A jet flies 1200 km at 600 km/h and 1800 km at 900 km/h. Calculate the overall average speed.

Answers & Worked Solutions

Model Solutions

- **I Do:** $T_1 = 1.5$ h, $T_2 = 1.5$ h $\implies$ Total Distance $= 150$ km, Total Time $= 3$ h $\implies$ Speed $= 50$ km/h
- **We Do:** Total Distance $= 200$ miles, Total Time $= 5$ h $\implies$ Speed $= 40$ mph
- **You Do:** $T_1 = 0.5$ h, $T_2 = 1.5$ h $\implies$ Total Distance $= 150$ km, Total Time $= 2$ h $\implies$ Speed $= 75$ km/h
- **Challenge:** $T_{\text{out}} = 2$ h, $T_{\text{ret}} = 3$ h $\implies$ Total Distance $= 240$ km, Total Time $= 5$ h $\implies$ Speed $= 48$ km/h ■

Practice Perfect Questions Solutions

Q1. 50 km/h

Q2. Total Time $= 4$ h, Average Speed $= 12.5$ km/h

Q3. Total Time $= 1.25$ h, Average Speed $= 32$ mph

Q4. Total Time $= 4$ h, Average Speed $= 45$ km/h

Q5. Total Time $= 1.5$ h, Average Speed $= 6.67$ km/h

Q6. Total Time $= 4$ h, Average Speed $= 750$ km/h