CLASS 7 SCIENCE NCERT SOLUTIONS

NCERT Solutions for Class 7 Science Chapter 8: Measurement of Time and Motion – Curiosity

Complete NCERT Solutions for Class 7 Science Chapter 8 "Measurement of Time and Motion" from the Curiosity textbook, covering historical timekeeping, speed calculations, and uniform vs non-uniform motion.

Contents

Complete NCERT Solutions for Class 7 Science Chapter 8 “Measurement of Time and Motion” from the Curiosity textbook, covering historical timekeeping, speed calculations, and uniform vs non-uniform motion.

In-Text Questions

Q1. How was time measured before clocks and watches?
Answer: Time was measured using instruments like sundials, water clocks, hourglasses, and candle clocks.

Q2. How can we tell who was faster when comparing races of different distances?
Answer: For races of different distances, we cannot compare times directly; instead we compute and compare each runner’s **speed** (distance ÷ time), since speed accounts for both the distance covered and the time taken.

Q3. Some marathon runners kept the same speed, while others sped up or slowed down. How does their motion differ?
Answer: Runners who maintain the same speed throughout have **uniform motion**; those who speed up or slow down have **non-uniform motion**.

Exercise Questions

Q1. A car travels 150 m in 10 s. Find its speed in km/h.
Answer: Speed = 150m ÷ 10s = 15 m/s. Converting to km/h: 15 × 18/5 = **54 km/h**.

Q2. Runner 1 covers 400 m in 50 s; Runner 2 covers 400 m in 45 s. Who is faster, and by how much?
Answer: Runner 1’s speed = 400/50 = **8 m/s**. Runner 2’s speed = 400/45 ≈ **8.89 m/s**. Runner 2 is faster, by approximately 8.89 − 8 = **0.89 m/s**.

Q3. A train travels at 25 m/s and covers 360 km. How much time does it take?
Answer: Distance = 360 km = 3,60,000 m. Time = 3,60,000 ÷ 25 = 14,400 s = 240 minutes = **4 hours**.

Q4. A train travels 180 km in 3 hours. Find its speed in (i) km/h (ii) m/s, and (iii) distance in 4 hours at the same speed.
Answer: (i) Speed = 180/3 = **60 km/h**. (ii) In m/s: 60 × 5/18 ≈ **16.67 m/s**. (iii) Distance in 4h = 60 × 4 = **240 km**.

Q5. A galloping horse reaches about 18 m/s. How does this compare to a train moving at 72 km/h?
Answer: Train’s speed in m/s: 72 × 5/18 = 20 m/s. The train is faster than the horse by 20 − 18 = **2 m/s**.

Q6. Distinguish uniform and non-uniform motion using a highway car vs a car in city traffic.
Answer: Uniform motion means covering equal distances in equal time intervals (e.g., a car moving on a straight highway with no traffic). **Non-uniform motion** means covering unequal distances in equal time intervals (e.g., a car moving through city traffic, constantly speeding up and slowing down).

Q7. Complete a distance-time table assuming uniform motion (given: 0,8,_,24,32,40,_,56 m at 0,10,20,30,40,50,60,70 s).
Answer: Since the object covers 8 m every 10 seconds (constant speed of 0.8 m/s), the missing values are: at t=20s, distance=**16 m**; at t=60s, distance=**48 m**.

Q8. A car covers 60 km, 70 km, and 50 km in three successive hours. Is this uniform motion? Find the

average speed.
Answer: Since the distances covered each hour are different, this is **non-uniform motion**. Total distance = 60+70+50 = 180 km; total time = 3 h. Average speed = 180/3 = **60 km/h**.

Q9. Which is more common in daily life — uniform or non-uniform motion? Give three examples.
Answer: Non-uniform motion is far more common, since speed usually changes due to traffic, uneven roads, or obstacles. Examples: travelling in a bus on an uneven road, playing cricket (running between wickets), and walking through a crowded market.

Q10. Given distance data over 10-second intervals (distances covered: 6, 4, 6, 5, 8, 6, 7, 3, 10, 5 m), determine if the motion is uniform and find the average speed.
Answer: Since the object covers different distances in each equal time interval, the motion is **non-uniform**. Total distance = 6+4+6+5+8+6+7+3+10+5 = 60 m; total time = 100 s. Average speed = 60/100 = **0.6 m/s**.

Q11. A vehicle covers 2 km total. First 500m at 10 m/s, next 500m at 5 m/s. What speed is needed for the remaining distance to finish the 2 km journey in 200 s total? Find the average speed.
Answer: Time for first 500m = 500/10 = 50s. Time for next 500m = 500/5 = 100s. Time used so far = 150s; remaining time = 200−150 = 50s. Remaining distance = 2000−1000 = 1000m. Required speed = 1000/50 = **20 m/s**. Average speed for the whole journey = total distance/total time = 2000/200 = **10 m/s**.

Chapter Activities

Activity 8.3: Reading a wall clock

The smallest time interval measurable on a typical analog wall clock (with a seconds hand) is **one second**.

Activity 8.4: Calculating train speeds

Using distance and time data between railway stations, speed is calculated using Speed = Distance ÷ Time for each train segment (e.g., a train covering 214 km in 2h 12min travels at approximately 97.3 km/h). This activity demonstrates applying the speed formula to real timetable data.

Extra Questions: Class 7 Science Chapter 8
Revision Notes: Class 7 Science Chapter 8