Robot Speed Test

Use position readings to compare average speeds.

PHS.5.3 "Collect, organize, and interpret graphical data using correct metric units to determine the average speed of an object."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle the metric unit in each table heading, then underline the sentence that tells you how to calculate average speed. These marks will help you use the readings correctly.

A Robot on the Test Track

1. At an indoor test track, a small delivery robot travels in a straight line while a sensor records its position. The table shows elapsed time in seconds (s) and distance from the starting line in meters (m). Each row is one sensor reading, not the distance traveled during just that interval. The robot never reverses direction.

DELIVERY ROBOT SENSOR READINGS

Time (s)	Distance from start (m)
0	0
2	3
4	9
6	12
8	20

2. To turn the readings into a distance-time graph, put time on the horizontal axis and distance on the vertical axis. Label the axes with s and m, then plot each pair of readings as one point. Connect points in time order. A steeper segment means the robot covers more meters in each second during that interval.

3. Average speed compares distance traveled with elapsed time: divide the change in distance by the change in time. For example, a different cart that travels 14 m in 7 s averages 2 m/s. For an interval, subtract its starting reading from its ending reading in each column. To compare intervals fairly, use meters per second (m/s), not distance alone.

2 ANSWER WITH EVIDENCE

Use the passage

1. What point would you plot for the reading at 4 s? Give the time and distance with units.

2. What was the robot's average speed from 2 s to 4 s? Show your calculation.

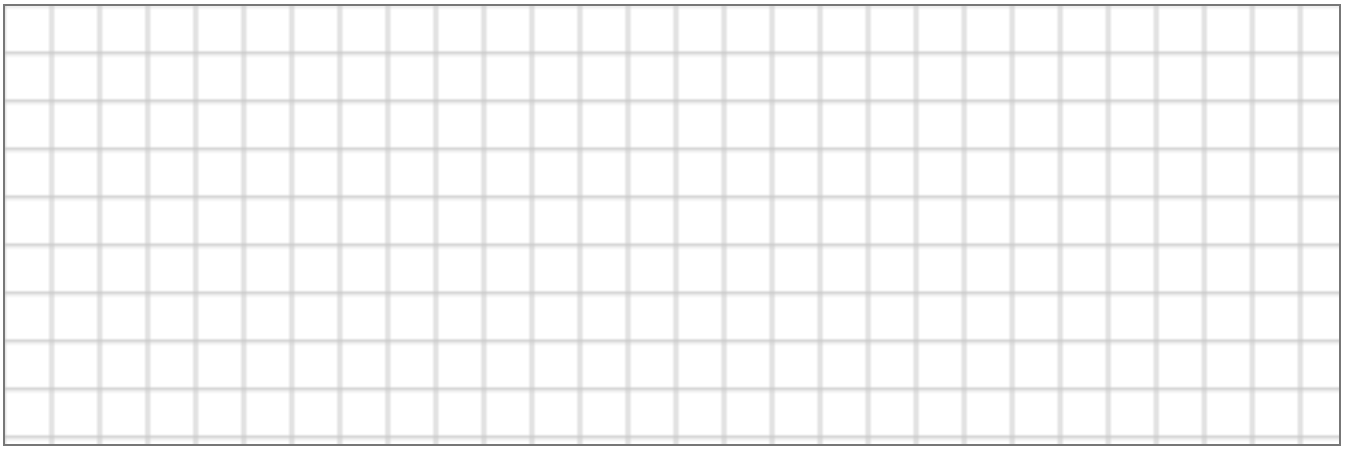
3. What was the robot's average speed over the full 8 s trial? Show your calculation.

4. Was the robot faster from 4 s to 6 s or from 6 s to 8 s? Calculate both average speeds to support your answer.

3 YOUR TURN

Your own words

Collect these readings from a second robot trial and plot a distance-time graph on the grid: at 0 s, 0 m; at 3 s, 6 m; at 6 s, 15 m; and at 9 s, 18 m. Label both axes with metric units, connect the points in time order, and write a calculation for the robot's average speed over the full trial.



ANSWER KEY

Robot Speed Test

PART 1 · READ AND MARK

Circle the metric unit in each table heading, then underline the sentence that tells you how to calculate average speed. These marks will help you use the readings correctly. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What point would you plot for the reading at 4 s? Give the time and distance with units.	**(4 s, 9 m).**
2	What was the robot's average speed from 2 s to 4 s? Show your calculation.	**(9 m - 3 m) ÷ (4 s - 2 s) = 3 m/s.**
3	What was the robot's average speed over the full 8 s trial? Show your calculation.	**(20 m - 0 m) ÷ (8 s - 0 s) = 2.5 m/s.**
4	Was the robot faster from 4 s to 6 s or from 6 s to 8 s? Calculate both average speeds to support your answer.	**From 4 s to 6 s: (12 - 9) m ÷ 2 s = 1.5 m/s. From 6 s to 8 s: (20 - 12) m ÷ 2 s = 4 m/s. It was faster from 6 s to 8 s.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Graph: horizontal axis labeled Time (s), vertical axis labeled Distance from start (m); points at (0, 0), (3, 6), (6, 15), and (9, 18), connected in time order. Average speed = (18 m - 0 m) ÷ (9 s - 0 s) = 2 m/s.

Accept equivalent calculations with correct units. For the graph, check the axis labels, all four plotted points, and their time order.