

Cart Motion Clues

Use position and time to describe motion along a straight path.

PS.8.a "motion can be described using position and time; and"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each time, circle each position, and number the time intervals in the text and table so you can connect position changes to elapsed time.

Tracking a Hallway Cart

- ① To describe motion, scientists first choose a reference point, such as the east end of a dock. They state position as distance and direction from that point. Then they record position at different times. A position without its reference point, direction, and time does not fully describe motion.

ROBOT CART MEASUREMENTS

Time (s)	Position from start (m)
0	0
2	+4
4	+8
6	+8
8	+3

- ② The table records a robot cart's position on a straight hallway. Positions east of the start are positive, and positions west are negative. Each row is a recorded measurement, not a claim about every moment between measurements. To find a change in position, subtract the earlier position from the later position. The sign of the change shows direction.
- ③ From 0 to 4 seconds, the cart's position changes by +8 meters, so it moves east. At 4 and 6 seconds, both recorded positions are +8 meters. These measurements show the cart was at the same recorded position at those times, but do not prove what happened between them. From 6 to 8 seconds, it moves west.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What was the cart's position at 2 seconds? Include its direction from the start.

2 What was the cart's change in position from 0 to 2 seconds? State the direction of motion.

3 What was the cart's change in position from 2 to 4 seconds? State the direction of motion.

4 At which recorded time or times was the cart farthest east of the start?

3 YOUR TURN _____ Your own words

Create a motion record for a walker at 0, 2, 4, and 6 seconds. Use a start line as the reference point, write a signed position for each time, and calculate each change in position. In the first change cell, write "start."

TIME (S)	POSITION FROM START (M)	CHANGE SINCE PREVIOUS TIME (M)

PART 1 • READ AND MARK

Underline each time, circle each position, and number the time intervals in the text and table so you can connect position changes to elapsed time. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What was the cart's position at 2 seconds? Include its direction from the start.	+4 m, or 4 m east of the start.
2	What was the cart's change in position from 0 to 2 seconds? State the direction of motion.	+4 m, so the cart moved east.
3	What was the cart's change in position from 2 to 4 seconds? State the direction of motion.	+4 m, so the cart moved east.
4	At which recorded time or times was the cart farthest east of the start?	At 4 seconds and 6 seconds.

PART 3 • YOUR TURN (SAMPLE ANSWER)

TIME (S)	POSITION FROM START (M)	CHANGE SINCE PREVIOUS TIME (M)
0	0	start
2	+3	+3
4	+1	-2
6	-4	-5

Accept any coherent set of signed positions and correctly calculated later-minus-earlier changes. The first change cell should say "start" or an equivalent statement showing that no earlier measurement exists.