Rover Predictions

Use a steady-speed pattern to estimate missing distances.

FSL.3B.4 "Perform a simple interpolation or simple extrapolation using data in a table or graph. Determine and/or use a simple (e.g., linear) mathematical relationship that exists between data."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle two table rows that show a change in distance over time. Underline one sentence that explains why a prediction beyond the table might be uncertain.

A Rover on the Move

1. A rover rolls across a level classroom floor while a motion sensor records its position. The table shows distance from the starting line at several times. During this trial, the rover moves at a steady speed. Each new reading is two seconds later than the one before it, so comparing rows can reveal how far it travels each second.

ROVER TRIAL

Time (seconds)	Distance (meters)
0	0
2	6
4	12
6	18
8	24

2. Scientists often need estimates for moments when no reading was taken. An estimate between two recorded times is called interpolation. If the distance rises by the same amount in each equal time interval, you can use that pattern to estimate a missing value. Check the units before you divide a change in distance by a change in time.

3. A prediction for a time beyond the recorded times is an extrapolation. It uses the same distance pattern, but it is less certain because the rover might slow down, speed up, or stop. Use the pattern only if you have a reason to think the conditions stay the same. Here, the level floor and steady motor support short-range predictions.

2 ANSWER WITH EVIDENCE

Use the passage

1. How many meters does the rover travel each second? Show how two table readings give your rate.

2. Estimate the rover's distance at 3 seconds. How did you find it?

3. Estimate the rover's distance at 5 seconds. How did you find it?

4. If the rover keeps the same speed, how far will it be from the starting line at 10 seconds? Show your calculation.

3 YOUR TURN

Your own words

Choose two times not shown in the table: one between 6 and 8 seconds and one between 10 and 12 seconds. Predict the rover's distance at each time, label each prediction as interpolation or extrapolation, and explain why the later prediction might be less reliable.

ANSWER KEY

Rover Predictions

HIGH SCHOOL · FSL.3B.4

PART 1 · READ AND MARK

Circle two table rows that show a change in distance over time. Underline one sentence that explains why a prediction beyond the table might be uncertain. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How many meters does the rover travel each second? Show how two table readings give your rate.	**The rover travels 3 meters per second. From 0 to 2 seconds, it travels 6 meters, and 6 ÷ 2 = 3.**
2	Estimate the rover's distance at 3 seconds. How did you find it?	**9 meters. Three seconds is halfway between 2 and 4 seconds, so the distance is halfway between 6 and 12 meters.**
3	Estimate the rover's distance at 5 seconds. How did you find it?	**15 meters. Three meters added to the 4-second distance of 12 meters gives 15 meters.**
4	If the rover keeps the same speed, how far will it be from the starting line at 10 seconds? Show your calculation.	**30 meters. At 3 meters per second, it travels 3 × 10 = 30 meters.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At 7 seconds, I predict 21 meters. This is interpolation because 7 seconds falls between recorded times. At 11 seconds, I predict 33 meters. This is extrapolation because 11 seconds is beyond the recorded times. The later prediction might be less reliable if the rover slows down.

Accept any pair of times within the stated ranges with distances calculated at 3 meters per second. The first prediction must be labeled interpolation and the second extrapolation.