

Distance and Time: Steady Motion

Measure position at equal times and graph distance versus time

Name: _____ Date: _____

Part 1 - Measure the moving object

Goal: Find how far a toy object is from its start line at equal time intervals. Your class will measure a teacher-led object that is moving as steadily as possible.

Distance means: the distance from the start line to the front of the object. **Time zero:** the object is at the start line before it begins moving.

Technique sample - fictional practice data, not your data:

Time (s)	Distance from start (m)
0	0.00
2	0.55
4	1.08
6	1.65

The distances do not have to be exactly alike. Measure carefully and record what you observe.

1. Collect class data. Listen for the timer calls. At each call, read the meter tape and record the object's distance. Include units.

Time (s)	Distance from start (m)
0	
2	
4	
6	
8	
10	

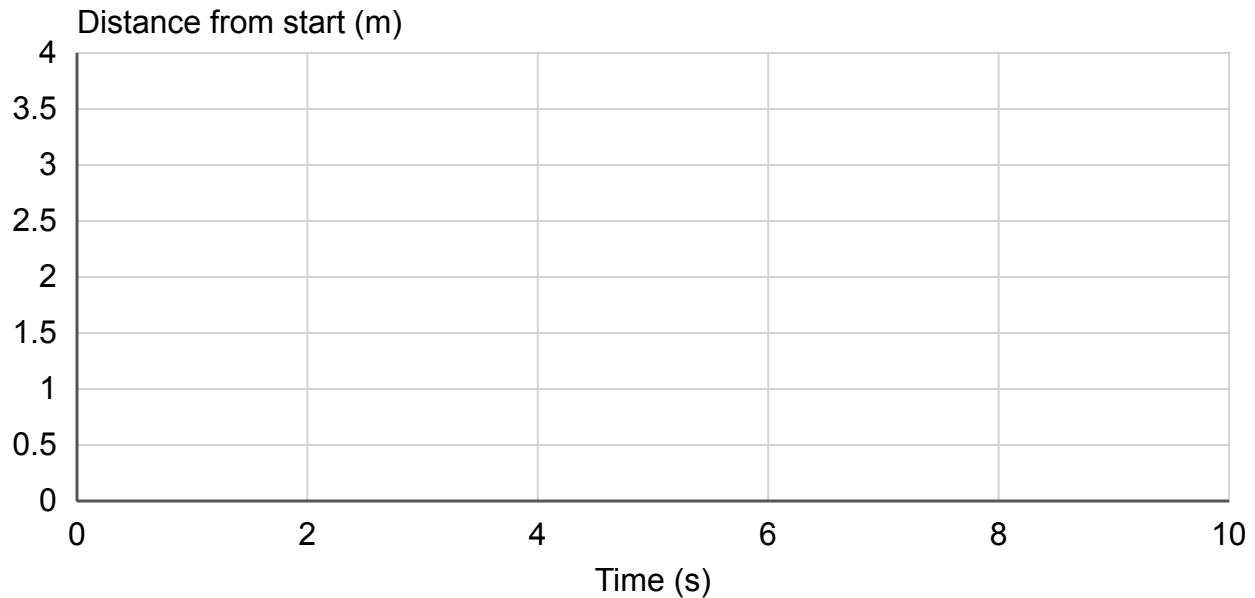
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Part 2 - Plot and interpret

2. Plot your class data. On the graph, plot one point for each table row: time on the horizontal axis and distance on the vertical axis. Do not connect points until all six points are plotted. Then use a ruler to draw one straight trend line that follows the overall pattern.



3. Explain your graph. Does it show approximately constant speed? Use the pattern of points and compare equal time intervals in your answer.

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Teacher setup and teaching notes

Materials

Supplied: student recording table, fictional technique sample, and blank labeled graph.

Additionally needed: one wheeled toy or small cart; 4 m or longer meter tape; masking tape for a start line; timer or stopwatch with an audible signal; pencils; rulers; smooth, clear floor or tabletop; optional string to pull the cart.

Exact setup

1. Tape the meter tape straight along a 4 m path. Put its 0 m mark at a taped start line.
2. Place the toy so its front edge is at 0 m. Choose one edge of the toy that all observers will use.
3. Practice pulling the toy with a string, or guiding it by hand, slowly for 10 seconds. Aim for about 3 m total distance. Do not use a ramp.
4. Assign one student to call or run the timer, one to read the tape, and one to record. Other students independently record the class measurement.

Teaching script - read aloud

"Distance zero is the start line. We will use the front edge of the toy every time. When I say 'go,' the timer starts at 0 seconds and I will move the toy as steadily as I can. At 2, 4, 6, 8, and 10 seconds, look straight down at the tape, say the distance in meters, and record what we actually observe. Small differences are normal. We are looking for similar distance changes during equal time intervals, not perfect numbers."

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Answer key and assessment notes

Observation method

Circulate while students record. Check that each student has 0 s paired with 0 m, uses meters, records a measured value at every 2-second interval, and plots time horizontally and distance vertically. If a reading is missed, repeat the whole trial rather than inventing a value. A second trial may be collected, but students should graph one clearly labeled trial.

Answers and rubric

1. Collect class data: Answers vary because students record actual measurements. Accept a complete table with 0 s = 0 m and six readings at 0, 2, 4, 6, 8, and 10 s. Values should generally increase as the object moves forward; minor reading variation is acceptable.

2. Plot data: Accept six correctly located points from the student's own table, with time on the x-axis and distance on the y-axis. The trend line should be rising and approximately straight if the motion was reasonably steady. Do not require a perfectly straight line.

3. Explain the graph: Sample acceptable response: "Yes, the graph shows approximately constant speed because the points are close to a straight rising line. During each 2-second interval, the distance increased by about the same amount." Also accept a supported "not approximately constant" response if the student's measured equal-time distance increases differ substantially and the graph supports that claim.

Technique sample check: From 0 to 6 s, the fictional sample's average speed is $1.65 \text{ m} / 6 \text{ s} = 0.275 \text{ m/s}$. This calculation is for teacher discussion only; students do not need to calculate a speed.

Source credit: Florida B.E.S.T./Next Generation Sunshine State Standards task statement, SC.6.P.12.1, "Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship." <https://lessonmakerpro.com/standards/fl-science/sc-6-p-12-1>