Conclusive statement: state the relationship

Supporting Data: Max and Min.

State your equation -

explain what X and Y are, OR what d and t are.

Analyze the data: slope

What does your y-intercept represent?

Scientific Explanation: Prediction

Confidence

\[ \frac{d}{t} = 1.271 \]

\[ \frac{d}{t} = 1.271 = \text{Velocity} \]

\[ y = \frac{d}{t} \]

\[ V = \frac{d}{t} \]
Motion Graphs
Distance vs. Time Graphs

As time goes on, Ms. Haber gets further from her initial position.
Walk in a straight line, at a constant speed.

Describe the motion of ball displayed in each graph?

- staying in the same spot-1.5 meters
- not moving
- slope = 0, slope represents the velocity/speed -> speed = 0
- starts at 2 m, goes backward to 0 m.
- moving at a constant rate - linear
- negative slope = negative velocity
Speed Vs. Velocity:

Distance: how far something travels

![Diagram showing distance between two points]

we measure the total distance something travels by adding up the segments.

Displacement: change in position

To get to the grocery store you travel
2 miles, your position changes by 2 miles.

\[\text{Therefore} \quad \text{your displacement is 2 miles}\]

When you ride to the grocery store
and back you have traveled a distance of
(2 miles out + 2 miles back = 4 miles).

but your position has not changed.

\[\text{Therefore} \quad \text{your displacement is 0}\]

Speed: rate of motion - a distance traveled divided by the
amount of time spent traveling.

\[
\text{Speed} = \frac{\text{distance (m)}}{\text{time (s)}}
\]

Units: \(\text{m/s}\)

Velocity: the rate at which an object changes position

\[
\text{Velocity} = \frac{\text{displacement}}{\text{time}}
\]

Units: \(\text{m/s}\)
Motion Graphs

Distance time graph

- move forward with a constant speed.
- slope does not change --> speed/velocity does not change

Describe the motion of ball displayed in each graph?

Stationary at 1.5m
slope = 0 --> speed/velocity = 0

starts at 2m from origin, rolls toward the origin. with a constant negative velocity.

Speed vs Velocity:

- speed + direction
- how fast you move
- how far you move per unit time
Distance: How far something goes, how far something is from any given point.

Displacement: Change in position.

When you travel to the grocery store your displacement is 2km.
\[
\text{final position (Xf) - initial position (Xi)} \\
2\text{km} - 0\text{km} = 2\text{km}
\]

When you travel from the grocery store to home your displacement is
\[
\text{Xf - Xi;} \\
0\text{km} - 2\text{km} = -2\text{km}
\]

When you travel to the grocery store and then back home your displacement is zero.

Speed: the distance traveled divided by the amount of time spent traveling.

\[ \text{Speed} = \frac{\text{distance (m)}}{\text{time (s)}} \] units: \( \frac{m}{s} \)

Velocity: the rate at which an object changes position.

\[ \text{Velocity} = \frac{\text{displacement}}{\text{time}} \] units: \( \frac{m}{s} = \text{displacement} \)

\[ V = \frac{d}{t} \Rightarrow d = Vt \]

-2km
Motion Graphs

Distance Time graph:

Move with a constant speed/velocity. The same amount of distance for each amount of time.

Constant positive slope = constant positive velocity

Describe the motion of ball displayed in each graph?

Ball is staying in one place, 1.5m, not moving.
Slope=0 --> speed/velocity=0

Ball starts at 2m, and moves back to the origin.
the slope is negative so the velocity is negative.
Distance: amount something travels, length between objects

Displacement: Change in position

When you walk to the grocery store, you travel a distance of 2 km.
When you walk to the grocery store and home again, you travel a distance of (2 km out + 2 km back) = 4 km

When we travel to the grocery store, our displacement is 2 km.
Final position (Xf) - initial position (Xi) = displacement
2 km - 0 km = 2 km

When we travel from the grocery store to home, our displacement is -2 km.

When we travel to the grocery store and back, our displacement is zero.

Speed: distance traveled divided by the amount of time spent traveling

\[ S = \frac{d}{t} \]

Speed = \frac{distance (m)}{Time (s)} \quad \text{Units: m/s}

Velocity: the rate at which an object changes position.

\[ v = \frac{\Delta x}{t} \]

Velocity = \frac{displacement}{Time} \quad \text{Units: m/s}

Velocity is the speed AND direction