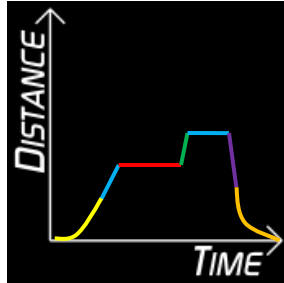


Graph This and That Notes

DISTANCE VS TIME (SPEED GRAPHS)

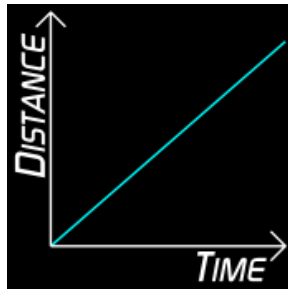
Plotting distance vs. time can tell you a lot about a journey.



Distance runs vertically (the **y-axis**). Time always runs horizontally (the **x-axis**).

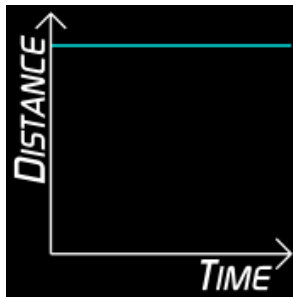
SLOPE = Rise/Run or Distance/Time which equals the AVERAGE SPEED

A straight line = constant speed.

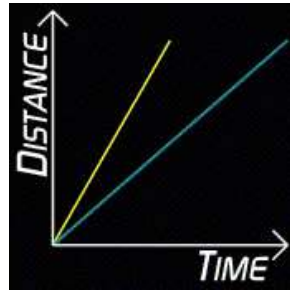


A straight, horizontal line means the distance traveled is not changing over time.

(Ex: You STOP to take a break during the mile run.)

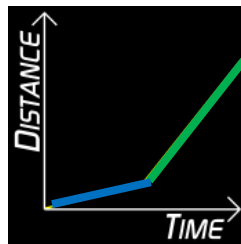


A greater SLOPE = greater average speed.



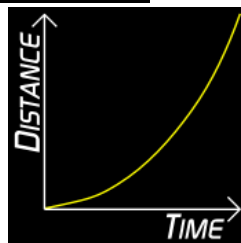
Both lines represent the same distance traveled, but the yellow line shows that it got there faster than the blue line (faster average speed).

This graph shows two different slopes. The first part of the trip (blue line) the object moved slower compared to the second part of the trip (green line).



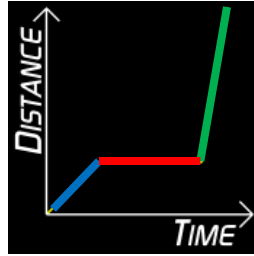
Both lines represent CONSTANT average speed.

A CURVE upwards means an INCREASE in average speed (NOT CONSTANT).



This means the average speed is changing which means it is ACCELERATING.

Describe what happens on this journey:

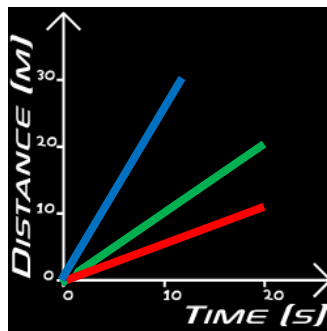


Segment 1:

Segment 2:

Segment 3:

Which line has the greatest average speed? Which is the smallest?
What about the line segment that is not the fastest or slowest?

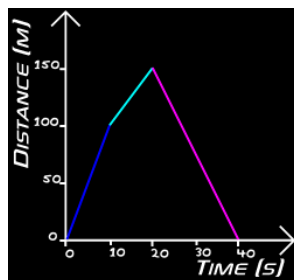


Remember, $speed = d/t$ so the steepness (SLOPE) of the line = average speed

COOL FACT: if you divide d/t at any given point on the line it = avg. speed.

Blue line:	Avg. Speed =	Distance / Time =	30 m / 10 s = 3 m/s
Green line:	Avg. Speed =	Distance / Time =	20 m / 20 s = 1 m/s
Red line:	Avg. Speed =	Distance / Time =	10 m / 20 s = .5 m/s

Find the average speed (for a kitty cat) for the 3 parts of the trip up a tree:



Part 1: 100 m in 10 s
Part 2: 50 m in 10 s
Part 3: 150 m in 20 s

Calculate the avg. speed of each part. Why does Part 3 have a negative slope?
How far did Mr. Kitty travel? What is the overall displacement?

Blue line: Avg. Speed = *Distance / Time* = 100 m / 10 s = **10 m/s**

Green line: Avg. Speed = *Distance / Time* = 50 m / 10 s = **5 m/s**

Purple line: Avg. Speed = *Distance / Time* = 150 m / 20 s = **7.5 m/s**

Mr. Kitty traveled a total of **300 meters**

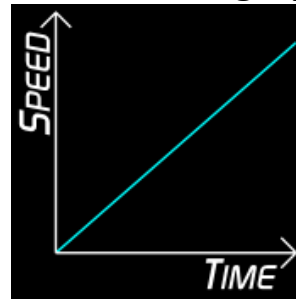
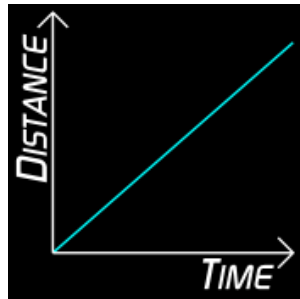
Overall displacement? = **0 meters**

SPEED VS TIME

(ACCELERATION GRAPHS)

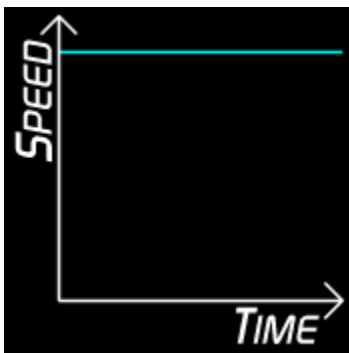
The first thing to note about these is that, on first glance, they look EXACTLY the same as distance vs. time graphs.

Spot the difference between these two graphs:



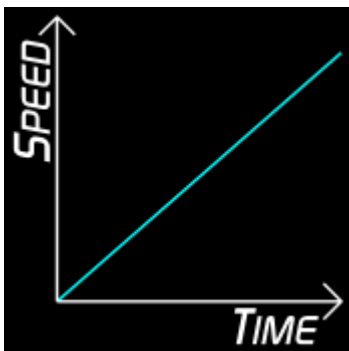
The only way you can tell the difference is by reading the labels on each axis.

A Horizontal line

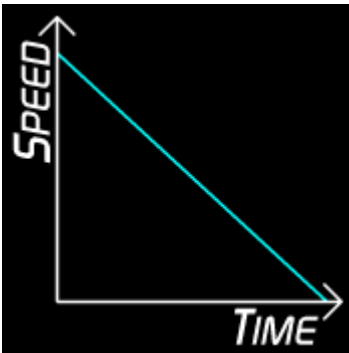


Don't be tempted to think this means it's not moving.

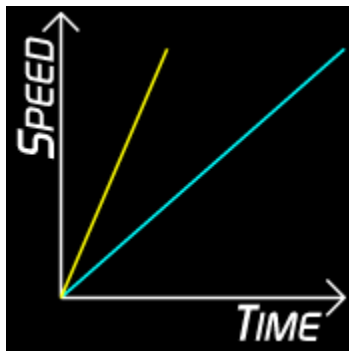
This is Speed vs. Time and the speed is both positive and constant. This shows a constant speed with NO ACCELERATION.



The speed is increasing, so the object must be accelerating.



The speed is decreasing, so the object must be decelerating.



Both the yellow and blue line show increasing speed.
They both reach the same top speed, but the yellow one accelerated faster and took less time (Ferrari vs. minivan)