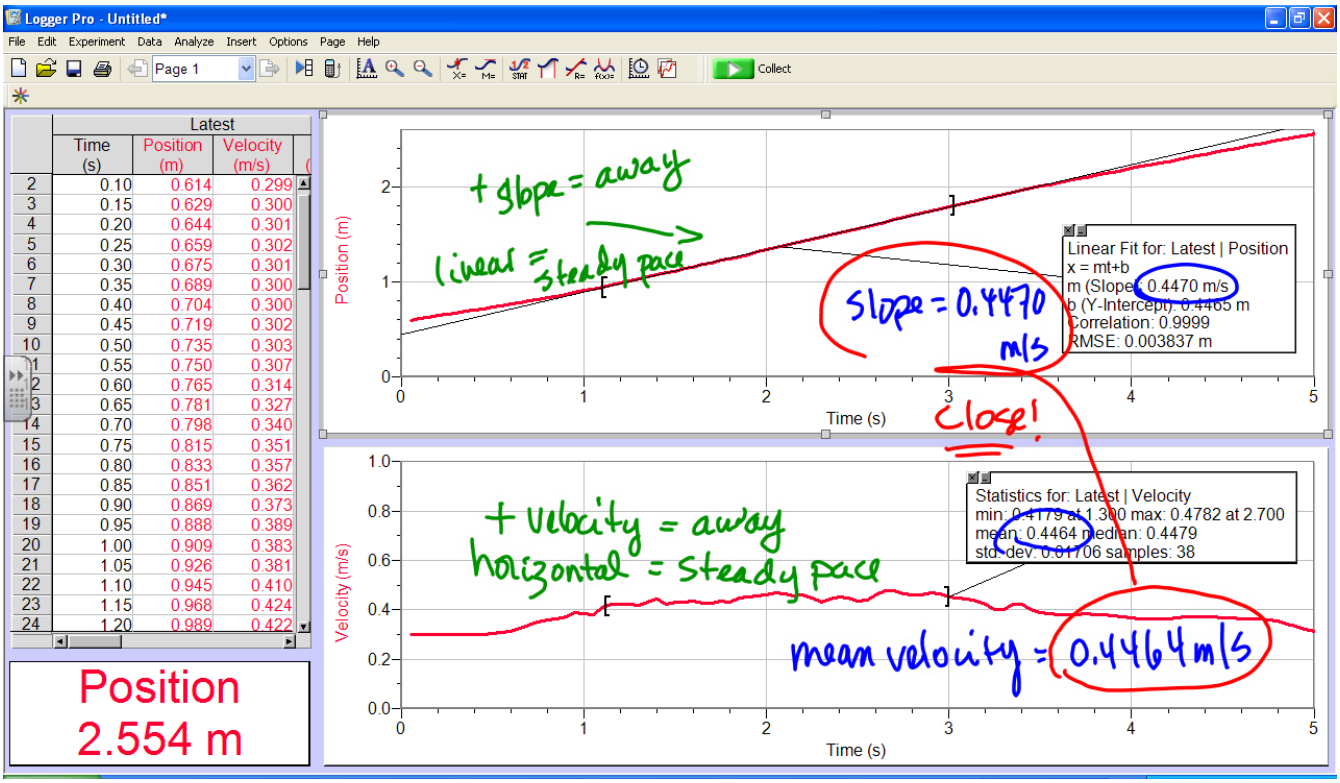
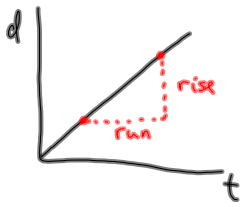

Logger Pro - Untitled*
File Edit Experiment Data Analyze Insert Options Page Help
Page 1
Collect
Latest
Time (s) Position (m) Velocity (m/s)
2 0.10 0.614 0.299
3 0.15 0.629 0.300
4 0.20 0.644 0.301
5 0.25 0.659 0.302
6 0.30 0.675 0.301
7 0.35 0.689 0.300
8 0.40 0.704 0.300
9 0.45 0.719 0.302
10 0.50 0.735 0.303
11 0.55 0.750 0.307
12 0.60 0.765 0.314
13 0.65 0.781 0.327
14 0.70 0.798 0.340
15 0.75 0.815 0.351
16 0.80 0.833 0.357
17 0.85 0.851 0.362
18 0.90 0.869 0.373
19 0.95 0.888 0.389
20 1.00 0.909 0.383
21 1.05 0.926 0.381
22 1.10 0.945 0.410
23 1.15 0.968 0.424
24 1.20 0.989 0.422
Position
2.554 m
+ slope = away
linear = steady pace
Position (m)
Time (s)
Linear Fit for: Latest | Position
x = mt+b
m (Slope): 0.4470 m/s
b (Y-Intercept): 0.4465 m
Correlation: 0.9999
RMSE: 0.003837 m
slope = 0.4470 m/s
close!
+ velocity = away
horizontal = steady pace
Velocity (m/s)
Time (s)
Statistics for: Latest | Velocity
min: 0.4179 at 1.300 max: 0.4782 at 2.700
mean: 0.4464 median: 0.4479
std. dev: 0.01706 samples: 38
mean velocity = 0.4464 m/s

Position-Time Graphs & Velocity

The slope on a position-time graphs tells you how fast the object is travelling and the direction that it travels (i.e. the velocity)

Constant Velocity



$\text{slope} = \frac{\text{rise}}{\text{run}}$

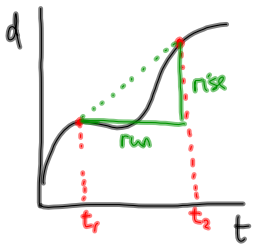
$\text{slope} = \frac{\Delta d}{\Delta t}$

from the DEMO, we know slope = velocity ($\frac{d}{t}$)

speed: $V = \frac{\Delta d}{\Delta t}$ (distance)

$\vec{V} = \frac{\Delta \vec{d}}{\Delta t}$ (displacement) velocity.

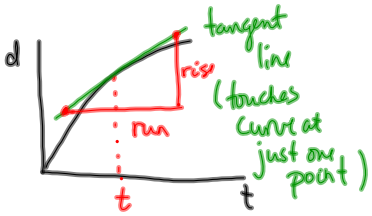
Non-Constant Velocity



$\text{slope} = \frac{\Delta d}{\Delta t}$

$\vec{V}_{ave} = \frac{\Delta \vec{d}}{\Delta t}$

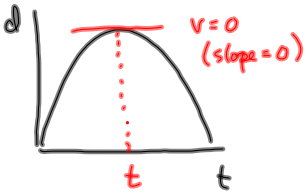
Average velocity is like finding the slope between two points on your graph.

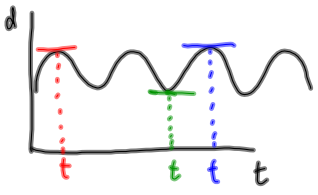


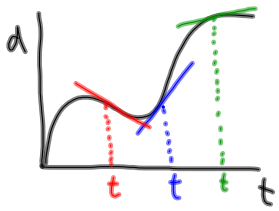
$\text{slope (of tangent)} = \frac{\Delta d}{\Delta t}$

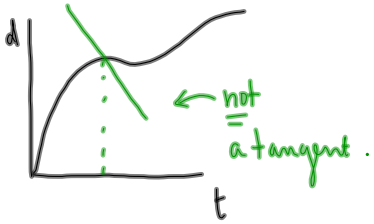
$\vec{V}_{inst} = \frac{\Delta \vec{d}}{\Delta t}$

Instantaneous velocity can be found by calculating the slope of the tangent drawn at time, t.





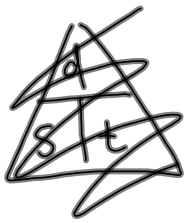




Velocity Equation

$$\vec{v} = \frac{\Delta \vec{d}}{\Delta t}$$

solve for $\Delta \vec{d}$: $\Delta \vec{d} = \vec{v} \Delta t$



solve for Δt: $\vec{v} \Delta t = \Delta \vec{d}$

$$\Delta t = \frac{\Delta \vec{d}}{\vec{v}}$$

Problem Solving:

GRASP

G - Given

R - Required

A - Analysis

S - Solution

P - Paraphrase