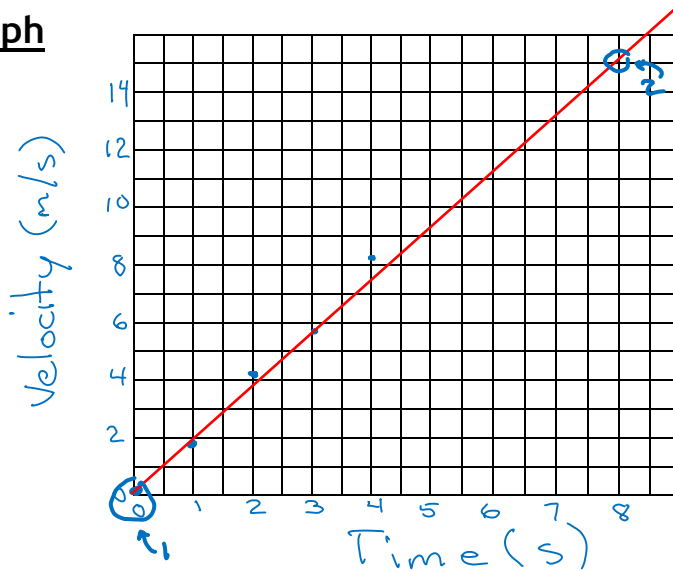


An Exemplary Graph

Time (s)	Velocity (m/s)
0.0	0.0
1.1	1.7
2.1	4.2
3.2	5.6
4.1	8.2



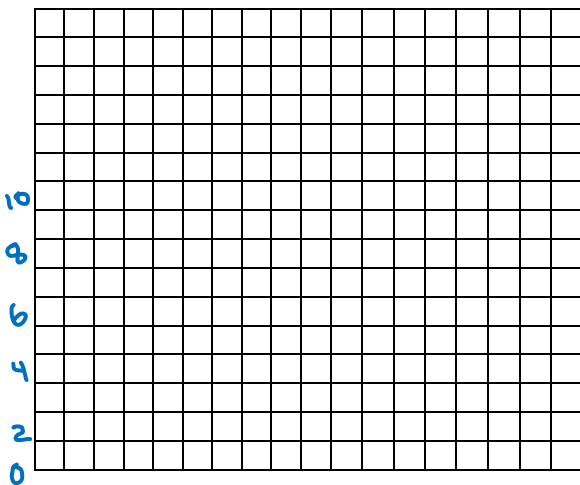
Slope of Best Fit Line:

$$= \frac{v_2 - v_1}{t_2 - t_1} = \frac{14.5 \text{ m/s} - 0 \text{ m/s}}{8 \text{ s} - 0 \text{ s}}$$

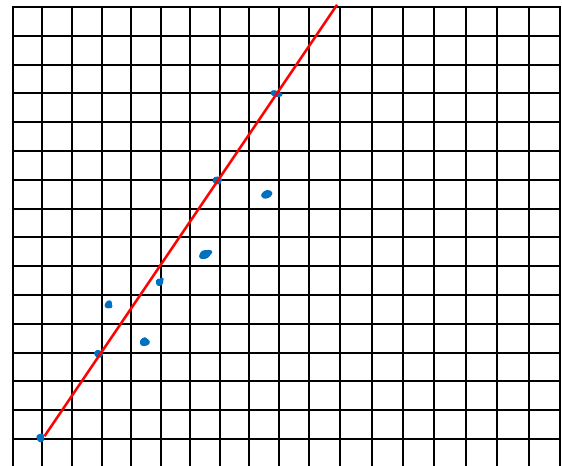
$$= \frac{14.5}{8} \text{ m/s}^2 = 1.81 \text{ m/s}^2$$

Common Mistakes

Numbering the Scale in Between Lines, Rather Than on Lines:



Best Fit Line Going Through Data Points:

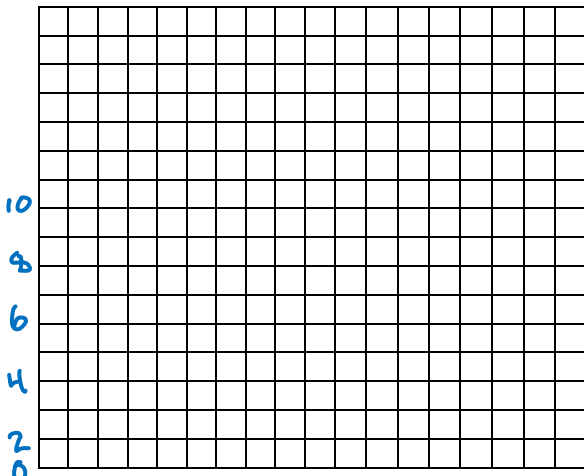


Slope of Best Fit Taken From Data Points, and Not From Best Fit Line Itself:

$$\text{slope} = \frac{8.2 \text{ m/s} - 0 \text{ m/s}}{4.1 \text{ s} - 0 \text{ s}}$$

$$= \frac{8.2}{4.1} \text{ m/s}^2 = 2.0 \text{ m/s}^2$$

Inconsistent Axis Scale:



Other Common Mistakes:

No axis labels, no units, numbers don't start at zero, best fit slope calculated from points too close together (less than $\frac{1}{2}$ the graph apart), swapping variables

Percent Difference Calculation

There are three different situations when you might want to calculate a percent difference. All three calculations follow the same pattern:

$$\text{percent difference} = \frac{\text{difference between two values}}{\text{whichever value you trust most}} \times 100\%$$

1. If comparing experimental value to an accepted value that is an established constant:

E = % Error

exp = value found during experiment

acc = accepted value of the constant (i.e. pi, e, 2, 9.8 m/s²)

$$E = \frac{\text{exp} - \text{acc}}{\text{acc}} \times 100\%$$

2. If comparing experimental value to a value predicted by theory:

E = % Error

exp = value found during experiment

theo = theoretical value predicted by an equation and assumptions

$$E = \frac{\text{exp} - \text{theo}}{\text{theo}} \times 100\%$$

3. If comparing two experimental values (neither one is “more correct” than the other):

E = % Difference

exp₁ = first experimental value

exp₂ = second experimental value

avg = mean experimental value = (exp₁ + exp₂)/2

$$E = \left| \frac{\text{exp}_1 - \text{exp}_2}{\text{avg}} \right| \times 100\%$$