

Unit 09 – Vocabulary and Equations – Linear Motion

<p>Vocabulary: nano (n), micro (μ), milli (m), centi (c), kilo (k) mega (M), giga (G), tera (T) SI (Système International d'units) Δ, vector, scalar, position (x), distance (Δx) displacement (Δx) speed (v), velocity (v), frame of reference magnitude of acceleration (a), acceleration (a) instantaneous (velocity, acceleration) average (velocity, acceleration) (\bar{v}, \bar{a}) direct reading, slope, area under curve</p>	<p>Symbols: Δ, x, v, t, Δx, Δv, Δt, a, f, i</p> <p>Equations & constants:</p> $v = \frac{\Delta x}{\Delta t} \qquad a = \frac{\Delta v}{\Delta t}$ $\Delta x = v_0 \Delta t + \frac{1}{2} a t^2 \qquad v_f^2 = v_i^2 + 2a \Delta x$ <p>$v = v_0 + a \Delta t$ (v means v_f) 1.609 km = 1 mile 60 mph = 27 m/s; 60 seconds = 1 min.; 60 min = 1hr.</p>
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Unit Objectives – Williams

1. I understand all the vocabulary & math of this unit and all demos, videos, equations, and class assignments.
2. I have memorized the assigned SI prefixes for the year; I know how to substitute these prefixes for numbers and vice-versa.
3. I know how to use the EE button on my calculator for problems involving exponential notation
4. I will use three significant digits or more in my answers this year to make sure my final answers are within 1% of correct value
5. I know how to use T-charts to convert between units
6. I can use concept of dimensional analysis to see if my answer units make sense
7. I understand the subtle differences between distance and displacement and other vector quantities compared to their scalar equivalents
8. I understand that all motion is relative and is measured from some frame of reference
9. I know what the three types of motion graphs are and the three ways to get information from them
10. I can see motion graphs and critically describe what they reveal and what they do not reveal
11. I know the difference between average and instantaneous values
12. I can apply one-dimensional motion equations to solve realistic problems
13. I can do "catch up" problems applying relative motions
14. I know what acceleration is conceptually and graphically

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101. I can distinguish between scalar and vector quantities.
102. I can differentiate between accelerated and constant velocity motion.
103. I can describe and analyze motion based on graphs, numeric data, words, and diagrams.
104. I can differentiate between speeding up, slowing down, and change in direction, based on the direction of velocity and acceleration.