

What is the momentum principle?	Newton's second law of motion. A change of momentum, caused by an interaction, is equal to the product of the net force acting on the system and the duration of the interaction. The product of this and the time interval is called an impulse and is measured in Ns. $\Delta \vec{p} = \vec{F}_{net} \Delta t$
What is the momentum update formula?	$\vec{p}_f = \vec{p}_i + \vec{F}_{net} \Delta t$
How can average velocity be calculated?	Average velocity is $\frac{(\Delta \vec{r})}{\Delta t}$ but it can be approximated by $\frac{(v_i + v_f)}{2}$ when net force is constant. When net force is variable, this makes a poor approximation.
What is spring force?	The magnitude of the force exerted by a spring is proportional to the absolute value of the distance the spring is stretched (s , this is positive if the spring is stretched and negative if it is compressed; $s = L - L_0$). An additional factor— k —is called the spring constant. It depends upon the stiffness of the spring. $ F_{spring} = k_s s $ Written as a vector, this is $\vec{F} = -k_s s \hat{L}$. $s = \vec{L} - L_0$; if it is positive, the spring is longer than its relaxed length—stretched—but \hat{L} will be negative; if it is negative, the spring is shorter than its relaxed length—compressed—but \hat{L} will be positive.
What is the force of gravity equal to?	$ F_{grav} \approx mg$ Where $g = +9.8 \text{ N/kg}$ near the surface of Earth.
What is average acceleration?	$\frac{\vec{F}_{net}}{m} \text{ or } \frac{\Delta v}{\Delta t}$
What are the kinematics equations?	A set of equations that connect force, momentum, velocity, acceleration, and position. $\Delta \vec{p} = \vec{F}_{net} \Delta t$ $\Delta \vec{r} = \vec{v}_{avg} \Delta t$ $\vec{r}_f = \vec{r}_i + v_i \Delta t + \frac{1}{2} a \Delta t^2$ $v_f = v_i + a \Delta t$