Feb. 11th

$p_x$ = momentum in $x$-direction $= mv_x$ $\qquad ma_x = \frac{d(mv_x)}{dt} \iff F_x = \frac{dp_x}{dt}$

In general, $\frac{d\vec{p}}{dt} = \vec{F}_{net}$

Suppose that $\vec{F}_{net}$ is constant

$$\vec{F}_{net}\Delta t = \Delta\vec{p}$$

Impulse $= \vec{F}_{net}\Delta t$, or more generally Impulse $= \int \vec{F}_{net}\,dt$

If $\vec{F}_{net} = 0$, then $\Delta\vec{p} = 0$. The total momentum of the system does not change. This is called the Law of Conservation of Momentum.