Non-Zero Total Force (NZTF) Skill Objectives

What you should know and be able to do by the end of the unit.

1. Use Newton's 2nd Law to qualitatively describe the relationships among $\Sigma \boldsymbol{F}$, m, and $\boldsymbol{a}$.
   · describe how a change in $\Sigma \boldsymbol{F}$ or mass would affect the acceleration
   · describe how either the $\Sigma \boldsymbol{F}$ or mass would need to change in order to obtain a particular acceleration
   · describe how $\Sigma \boldsymbol{F}$ and acceleration are proportional
   · describe how mass and acceleration are proportional

2. Use the total force upon an object in order to determine the object's acceleration, as well as other kinematic quantities ($\boldsymbol{v}_i$, $\boldsymbol{v}_f$, $\Delta \boldsymbol{x}$, Δt), by using a $\boldsymbol{v}$ vs. $\boldsymbol{t}$ graph or kinematic equations.

3. Determine the total force acting on an object by:
   · drawing a force diagram (free body diagram) for an object
      · from the force diagram, draw the corresponding vector addition diagram
   · analyzing the kinematic behavior of the object

4. Solve quantitative problems involving forces, mass and acceleration using Newton's 2nd Law.
   · Determine the total force (as in #3 above) in order to then solve for the acceleration.

• **Additional Study Hints**
   · Look over all our activities, worksheets, and questions of the day.
   · Form a study group and review together and quiz each other.