Interactions

Enduring Understanding - Momentum and energy are conserved when objects interact.

Work and Energy

Application of Newton's Third Law
Equal and opposite forces acting through the same displacement. (Previous Unit)

Impulse and Momentum

Application of Newton's Third Law
Equal and opposite forces acting over the same time interval.

Essential Question
Which is it harder to stop: a slow or fast moving object?

- Impulse Momentum Theorem
  - Momentum $p = mv$
  - Impulse $J = F_{net}\Delta t$
  - Theorem $J = F_{net}\Delta t = \Delta p = m\Delta v$

Essential Question
Why are some quantities conserved in a collision and others not conserved?

- Conservation of Momentum $m_1v_1 + m_2v_2 = m_1v_1' + m_2v_2'$
  - Collision Problems
    - Types of Collisions
      - Inelastic
        Perfectly Inelastic
        Recoil
        - Momentum is ALWAYS Conserved
        - Energy is ALWAYS Conserved
      - Elastic
        - Kinetic Energy is ALWAYS Conserved

Essential Question
Does heat mean temperature?

- Thermodynamics
  - Methods of Heat Transfer
    - Convention
      Conduction
      Radiation
  - Laws of Thermodynamics
    - Zeroth Law
      First Law - Conservation of Energy
      Second Law - Entropy
      Third Law - Absolute Zero

Elastic
$PE_{spring} = \frac{1}{2}kx^2$

BOLD lined boxes mean Pre-AP ONLY

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