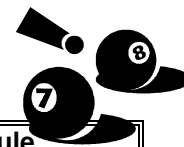


Unit 9 Plan: **The Big Mo (Momentum)**
 Physics1 @ PalmHarborUniversityHigh



Day	Date	Topic	Assignments Due / Schedule
1		Notes on Impulse & Momentum Read Section 9.1 CW#1 : problems (1,2 p.233)	Finish In-class problems
2		Bill Nye: The Big Mo CW#2 : problems (56,58,59,62,64 p.251)	Finish In-class problems
3		Collisions Demos Collisions & Conservation of Momentum CW#3 : problems (13,14,18 p.238)	Read Section 9.2 HW#1 (p. 253) : 75, 80, 82
4		Mechanical Universe Video: Momentum	TBA
5		Interactive Physics Lab	
6		Review Problem Handout	TBA
7		Review	
8		Unit Test	

Note: Homework is due on the day following the assignment, unless otherwise noted.

Objectives / Essential Learnings: (key terms in **bold**)

1. Define **momentum** and **impulse** and use the **impulse-momentum theorem** to calculate changes in momentum.
2. Give examples of how both size of the force and the length of the time interval affect the change in momentum.
3. Explain why impulses are greater when an object bounces than when the same object simply comes to a complete stop.
4. State the **law of conservation of momentum** and use it, especially in collision problems.
5. Recognize the link between Newton's 3rd law and the conservation of momentum in a closed, isolated system.
6. Distinguish between an elastic collision and an inelastic collision.
7. Give an example of how the vector nature of momentum affects the law of conservation of momentum.

momentum (p): $\mathbf{p} = m\mathbf{v}$ Impulse = $F\Delta t$ Change in momentum: $\Delta\mathbf{p} = \mathbf{p}_f - \mathbf{p}_i$
 $\Delta p = \Delta mv = m\Delta v$

Impulse-momentum theorem: (Impulse = **change** in momentum)

$$F\Delta t = \mathbf{p}_f - \mathbf{p}_i$$

$$F\Delta t = \mathbf{p}_f - \mathbf{p}_i = m\mathbf{v}_f - m\mathbf{v}_i$$

Conservation of Momentum: (momentum **before** = momentum **after**.....in a **closed, isolated** system)

for elastic: $m_A\mathbf{v}_A + m_B\mathbf{v}_B = m_A\mathbf{v}'_A + m_B\mathbf{v}'_B$

for inelastic: $m_A\mathbf{v}_A + m_B\mathbf{v}_B = (m_A+m_B) \mathbf{v}'$