



International House Tashkent Subject: Physics Department: ES, Course 1 Lesson 8. Conservation of momentum









A corner stone of physics is the conservation of momentum. This can be seen in all types of collisions.



## Momentum Review Question:

TIIAME

 Imagine a rubber and steel bullet each with the same mass and velocity. They each hit a wood block. The rubber bullet bounces off, while the steel bullet burrows into the block. Which one moves the wood block more?





 The steel bullet burrows into the block transferring all of its momentum to the block. ΔP= mv It moves the block

TIIAME

The rubber bullet bounces off transferring more momentum. If it bounces at the same speed, but opposite direction,  $\Delta P = 2mv$ . Thus, the block moves twice as much.





## Conservation of Momentum:



• In all collisions or interactions, momentum of a system is always conserved.

 You may have previously learned about conservation of mass or energy from chemistry class...





• Since momentum is a *vector* quantity, direction must be taken into account to see that momentum truly is conserved.

THAME





## Types of Collisions:

- ed.
- <u>Elastic collision:</u> momentum is conserved. The objects colliding aren't deformed or smashed, thus no kinetic energy is lost. *Ex:* billiard ball collisions





**Inelastic collision:** momentum is still conserved. Kinetic energy is lost. This often happens when object interlock or stick together. The objects are also often deformed or crunched. *Ex:* car crash



TIIAME



Conservation of Momentum Problems:



• When solving problems involving the conservation of momentum, the most important thing to consider is:

Total momentumTotal momentumbefore collision=Total momentumafter collision=