

Re: Momentum conservation

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- *From:* PD <TheDraperFamily@xxxxxxxxxx>
 - *Date:* Sat, 18 Aug 2007 18:19:36 -0700
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On Aug 18, 11:02 am, Peter <Poakfi...@xxxxxxxx> wrote:

On Aug 18, 11:04 am, PD <TheDraperFam...@xxxxxxxx> wrote:

On Aug 18, 8:46 am, Peter <Poakfi...@xxxxxxxx> wrote:

Hi! When a point object, like a steel ball, collides (without rolling) in one dimension with another identical object at rest, and stops on impact, the target object is supposed to acquire the momentum of the incident object. However, in all real collisions some heat and noise is always generated, which, of course, is energy that is dissipated. Where does this energy come from if momentum is conserved? How could momentum be conserved, if this energy comes at the expense of the kinetic energy of the object?

Hello Peter, I see you are back to worrying about basics. Momentum does not come from energy, and energy does not come from momentum. They are conserved wholly separately.

In any collision, linear momentum of a closed system is conserved. As long as the heat and noise in the collision is distributed isotropically in the case above, the momentum (a vector) carried by that heat and noise will be zero and so will not affect that result

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for the colliding particles.

In any collision, total energy is also conserved. However, unlike momentum, energy can be redistributed into several different forms, so that some of the initial kinetic energy before the collision can be turned into heat and sound energy, leaving less kinetic energy after the collision.

Most simple textbooks illustrate how in an elastic collision momentum is conserved AND kinetic energy is conserved (no losses to other energy dissipation in the collision), and how in an INELASTIC collision momentum is ST