

Elastic and Inelastic Collision

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Collisions are fundamental interactions in physics where two or more bodies exert force on each other. Collisions are of two types. Elastic collisions are those in which momentum and kinetic energy both are conserved, and Inelastic collisions, in which only momentum is conserved.

The experiment on collisions is provided in **Apps on physics > Mechanics > Elastic & Inelastic collision**. This simulation contains all relevant parameters.

The nature of a collision, whether it is elastic or inelastic is determined by the coefficient of restitution (e).

Where:

$$e = \frac{|v'_2 - v'_1|}{|v_2 - v_1|}$$

- v_1 and v_2 are the velocities of the two objects before the collision.
- v'_1 and v'_2 are the velocities of the two objects after the collision.

- **Elastic Collision:** When $e=1$, the collision is elastic, this indicates that no kinetic energy is lost.
- **Inelastic Collision:** When $0 < e < 1$, the collision is inelastic, meaning some kinetic energy is lost, but the objects get separated and move while momentum is conserved.
- **Perfectly Inelastic Collision:** When $e=0$, the collision is perfectly inelastic, meaning the objects stick together, resulting in maximum kinetic energy loss.

Key words: conservation of kinetic energy, conservation of momentum, coefficient of restitution.