

## 4.5: Collisions

---

Collisions occur when two (or more) particles hit each other. During a collision, those particles exert forces on each other, but in general, there are no external forces acting on the system consisting of the colliding particles. Consequently, the total momentum of all particles involved in the collision is conserved. Typically, we know the initial velocities and the masses of the particles, and want to calculate their final velocities - though of course you could also do it the other way around.

Although the total momentum of colliding particles is conserved, the total (kinetic) energy of all particles typically is not, as irreversible processes (such as plastic deformations of the particles) occur that are associated with non-conservative forces. In the special case that kinetic energy is conserved in a collision, we call the collision (totally) elastic. All other collisions are called inelastic, with the extreme case of a totally inelastic collision, in which the colliding objects stick together.

---

This page titled [4.5: Collisions](#) is shared under a [CC BY-NC-SA 4.0](#) license and was authored, remixed, and/or curated by [Timon Idema \(TU Delft Open\)](#) via [source content](#) that was edited to the style and standards of the LibreTexts platform.