

## CHAPTER OVERVIEW

### 5: Collisions

In this chapter on collisions, we shall have occasion to distinguish between elastic and inelastic collisions. An elastic collision is one in which there is no loss of translational kinetic energy. That is, not only must no translational kinetic energy be degraded into heat, but none of it may be converted to vibrational or rotational kinetic energy. In laying out the principles involved in collisions between particles, we need not suppose that the particles actually "bang into" – i.e. touch – each other. For example most of the principles that we shall be describing apply equally to collisions between balls that "bang into" each other and to phenomena such as Rutherford scattering, in which an alpha particle is deviated from its path by a gold nucleus without actually "touching" it. Of course, if you think about it at an atomic level, when two billiard balls collide, the atoms don't actually "touch" each other; they are repelled from each other by electromagnetic forces, just as the alpha particle and the gold nucleus repelled each other in the Rutherford-Geiger-Marsden experiment.

#### Topic hierarchy

[5.1: Introduction](#)

[5.2: Bouncing Balls](#)

[5.3: Head-on Collision of a Moving Sphere with an Initially Stationary Sphere](#)

[5.4: Oblique Collisions](#)

[5.5: Oblique \(Glancing\) Elastic Collisions, Alternative Treatment](#)

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