Monday Reading Assessment: Unit 8, Momentum

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November 18, 2019

1 Memory Bank

- $\vec{p} = m\vec{v}$ ... Definition of momentum.
- $\vec{p}_{\rm total} = \vec{p}_1 + \vec{p}_2$ ... Total momentum is the sum of two momenta.
- $\vec{p}_{\rm total,i} = \vec{p}_{\rm total,f}$ ... Momentum is conserved, like energy.
- $KE_{\rm Ti} = KE_{\rm Tf}$ ... Kinetic energy conservation (elastic collisions).
- $m_p = 1.67 \times 10^{-27}$ kg ... Mass of protons.

2 Momentum

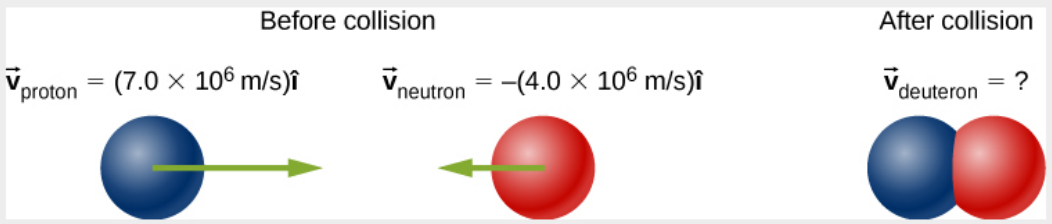

Figure 1: One car bumps another.

1. A proton collides with a neutron (with essentially the same mass as the proton) to form a particle called a deuteron. What is the velocity of the deuteron if it is formed from a proton moving with velocity 7.0×10^6 m/s to the right and a neutron moving with velocity -4.0×10^6 m/s to the left?

2. Check whether or not kinetic energy is conserved. (a) What is the initial total kinetic energy? (b) What is the final total kinetic energy?