

29.1: Conservation of Momentum

Momentum, like energy, is a conserved quantity: in a closed system (in which no momentum enters or leaves the system), the total momentum is constant. Unlike energy, though, momentum is a conserved vector quantity. This means that the following are all conserved:

- The vector momentum, \mathbf{p} ;
- The magnitude of the momentum, p ; and
- Each component of the momentum, p_x , p_y , and p_z .

In a closed system, momentum may be transferred from one body to another, but the total momentum—the sum of the momenta of all bodies in the system—will remain constant. Detailed examples of momentum conservation will be given in Chapter 28.

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