

## Types of Collisions

Type of collision	Diagram	What happens	Conserved quantity
perfectly inelastic	<p>The diagram shows two objects, <math>m_1</math> and <math>m_2</math>, moving towards each other. Object <math>m_1</math> has an initial velocity <math>v_{1,i}</math> and momentum <math>p_{1,i}</math>. Object <math>m_2</math> has an initial velocity <math>v_{2,i}</math> and momentum <math>p_{2,i}</math>. After the collision, the two objects stick together and move as a single object with mass <math>m_1 + m_2</math> and final velocity <math>v_f</math> and momentum <math>p_f</math>.</p>	The two objects stick together after the collision so that their final velocities are the same.	momentum
elastic	<p>The diagram shows two objects, <math>m_1</math> and <math>m_2</math>, moving towards each other. Object <math>m_1</math> has an initial velocity <math>v_{1,i}</math> and momentum <math>p_{1,i}</math>. Object <math>m_2</math> has an initial velocity <math>v_{2,i}</math> and momentum <math>p_{2,i}</math>. After the collision, the two objects bounce apart. Object <math>m_1</math> has a final velocity <math>v_{1,f}</math> and momentum <math>p_{1,f}</math>. Object <math>m_2</math> has a final velocity <math>v_{2,f}</math> and momentum <math>p_{2,f}</math>.</p>	The two objects bounce after the collision so that they move separately.	momentum kinetic energy
inelastic	<p>The diagram shows two objects, <math>m_1</math> and <math>m_2</math>, moving towards each other. Object <math>m_1</math> has an initial velocity <math>v_{1,i}</math> and momentum <math>p_{1,i}</math>. Object <math>m_2</math> has an initial velocity <math>v_{2,i}</math> and momentum <math>p_{2,i}</math>. After the collision, the two objects are deformed and move separately. Object <math>m_1</math> has a final velocity <math>v_{1,f}</math> and momentum <math>p_{1,f}</math>. Object <math>m_2</math> has a final velocity <math>v_{2,f}</math> and momentum <math>p_{2,f}</math>.</p>	The two objects deform during the collision so that the total kinetic energy decreases, but the objects move separately after the collision.	momentum