momentum = $p = mv$ Momentum is a vector. From the definition we see that the units for momentum are $\text{kg}\,\frac{\text{m}}{\text{s}}$.

conservation of momentum and kinetic energy in different types of collisions

	momentum Include the signs of the v's. Momentum is a vector, so use separate equations for x and y.	**energy** Energy is a scalar, so we don't need separate equations for x and y.	
elastic collision	momentum is conserved net p_i = net p_f implies: $m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f}$	kinetic energy is conserved net KE_i = net KE_f implies: $\frac{1}{2}m_1v_{1i}^2 + \frac{1}{2}m_2v_{2i}^2 = \frac{1}{2}m_1v_{1f}^2 + \frac{1}{2}m_2v_{2f}^2$ So $m_1v_{1i}^2 + m_2v_{2i}^2 = m_1v_{1f}^2 + m_2v_{2f}^2$	Solving the equations for conservation of momentum and energy for v_{1f} and v_{2f}, we get: $v_{1f} = \frac{m_1 - m_2}{m_1 + m_2}v_{1i} + \frac{2m_2}{m_1 + m_2}v_{2i}$ $v_{2f} = \frac{2m_1}{m_1 + m_2}v_{1i} + \frac{m_2 - m_1}{m_1 + m_2}v_{2i}$
inelastic collision	momentum is conserved net p_i = net p_f implies: $m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f}$	kinetic energy is not conserved	
totally inelastic collision objects stick together	momentum is conserved net p_i = net p_f implies: $m_1v_{1i} + m_2v_{2i} = (m_1 + m_2)v_f$	kinetic energy is not conserved	

net $F_{\text{external}} \times t$ = net Δp ($F\times$t = impulse)
So, when net $F_{\text{external}}=0$, momentum is conserved; and when $t\approx0$, momentum is approximately conserved.
Otherwise, momentum is not conserved.

Conservation of momentum is useful for solving problems about brief ($t\approx0$) collisions, separations, and joinings. Work and energy are useful for solving problems about velocity and displacement. Newton's Second Law plus kinematics is useful for solving problems about acceleration and time.