**9.4 Conservation of Momentum**

Newton’s 2nd law of motion 🡪 Impulse-Momentum theorem 🡪 Newton’s 3rd law of motion

F= ma a avg = Favg / m final speeds

of objects in a collision

Impulses J1x = -J2x

Momentum Px= P1x + Px2

- total momentum unchanged by collision

- x-component of total momentum is conserved

\*If ball 1’s momentum increases by a certain amount during the collision, ball 2’s momentum will decrease by exactly the same amount.

Internal forces- forces that act only between particles within the system (ex.- spring, gases)

External forces- forces from agents outside of the system (ex.- normal force, gravity on object, friction)

* P1= (F ext on 1) t

See page 264 for the “full” example

* P= Fnet t

Pf = Pi  (Formula for isolated system)

Isolated system- no net external forces acting

\*If Fnet = 0, the total momentum (P) doesn’t change

Law of Conservation Momentum- the total momentum (P) of an isolated system is constant. Interactions within the system do not change the system’s total momentum.

Pg. 266 copy/draw Figure 9.19 (forces acting on a system)

Explosions- opposite of a collision. If isolated then total momentum will be conserved