Chapter 4-3

- Newton's 2nd and 3rd Laws

Newton's 2nd Law

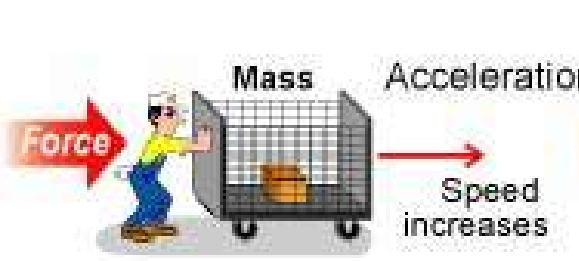
- Force is proportional to mass and acceleration.
- Force = Mass x Acceleration (F=ma)
- $A = (V_f - V_i)/\text{time}$

Newton's Second Law of Motion

$$\text{Acceleration } (\text{m/sec}^2) \rightarrow a = \frac{F}{m}$$

F ← Force (N)

m ← Mass (kg)



$$a = \frac{F}{m}$$

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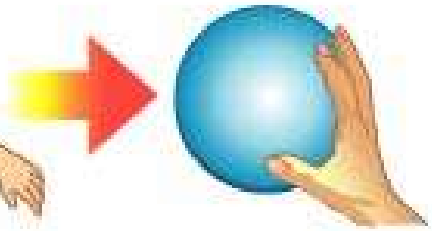
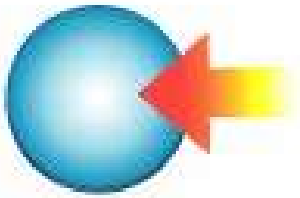
Newton's 3rd Law

- Forces always exist in pairs.
- Every action has an equal and opposite reaction.

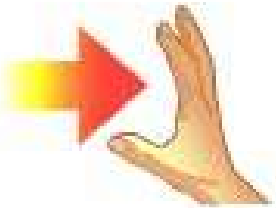
Newton's Third Law of Motion



When you throw a ball you create action and reaction forces.



Action force on ball



Reaction force on you

For every action force, there is a reaction force equal in strength and opposite in direction.

Practice 4B

- #1. The net external force on the propeller of a 3.2 kg model airplane is 7 N forward. What is the acceleration of the plane?
- Knowns?
- Unknown?
- Equation?
- Answer?