Warm-Up:

Forced Into It I

Newton's second law of motion states that if a net force acts on an object, that object will accelerate in the same direction as the net force. Another way of looking at it is to say that if an object is accelerating, there must be a net force acting on it.

Daily Warm-Ups: Physics

Circle each situation described below in which the object has a net force acting on it. For each one you circle, identify the direction in which the net force is acting.

1. A car moves to the right while slowing down. — Left
2. A marble moves in a circular path inside a paper plate at a constant speed. — Inward
3. The Moon orbits Earth. — Inward
4. An air hockey puck moves smoothly across the air hockey table after being struck. — X
5. A rocket is launched upward from the launch pad. — Upward

- Friction: resistive force that acts on objects in contact with each other
  - ↳ Does it apply to only solids? → Fluids as well [air resistance]

- Static Vs. Kinetic Friction

→ When you push an object you have to overcome friction

→ Coefficients of Friction: ratio of the force of friction
  - ↳ depends on surface type
  - ↳ ex: . ice or steel: low coefficients
    . Rubber or asphalt: high coefficients

- Friction = Coefficient • Normal Force

$$F_f = \mu_{\square} \cdot F_N$$

Coefficient of Static: ↳ μ_s = not moving
Coefficient of Kinetic: ↳ μ_K = already moving

Ex: A wooden pallet of 600 kg rests on a wooden floor

a. Forklift driver decides to push it without lifting. How much force to get it moving? $\mu_s = 0.28$

$$F_f = \mu_s \cdot F_N$$

$$F_f = 0.28 \cdot 600\text{kg} \cdot 9.8\text{m/s}^2$$

$$= \boxed{1646.4\text{ N}}$$

b. How much force required to keep it moving w/ constant velocity? $\mu_K = 0.17$

$$F_f = \mu_K \cdot F_N$$

$$F_f = 0.17 \cdot 600\text{kg} \cdot 9.8\text{m/s}^2$$

$$F_f = \boxed{999.6\text{ N}}$$