

$$W = FD$$

$$\text{Work} = \underset{\substack{\text{F} \\ \text{(N)}}}{F} \underset{\substack{D \\ \text{(m)}}}{D} \quad \text{NM or Joules}$$

↙

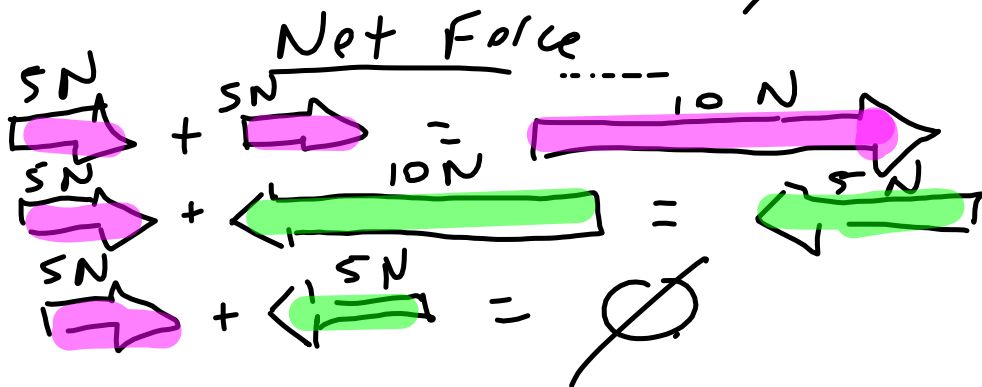
$$\left( \underset{\substack{\text{Newtons} \\ \text{---}}}{400.5 \text{ N}} \right) \left( .16 \right) \left( 30 \right) = 1922.4 \text{ J}$$

$$\text{--- lbs} \times 4.45 = \text{--- N}$$

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Force  $\rightarrow$  push or pull  
(strength + direction)

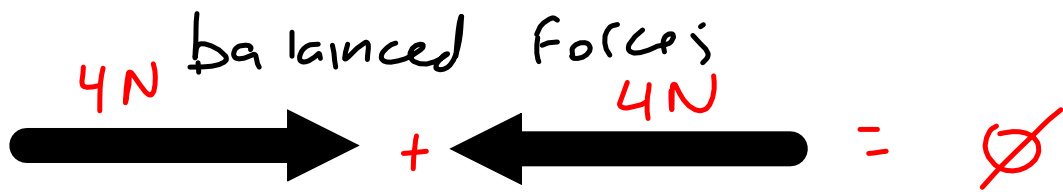
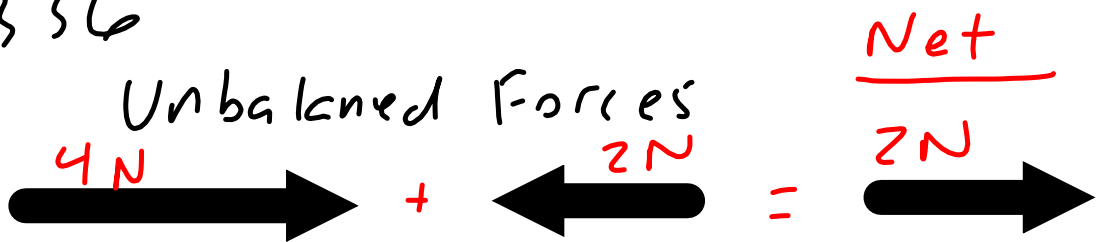
units  $\rightarrow$  (N)  $\left( \frac{\text{kgm}}{\text{s}^2} \right)$  Newtons



Weight

$$\begin{aligned} &\downarrow \\ &F = M A \\ &(N) = (kg) \left( \frac{m}{s^2} \right) \\ &= (1 \text{ kg}) (9.8) = 9.8 (N) \end{aligned}$$

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friction - force of 2 surfaces rubbing

- Strength -
1. how hard they rub
  2. type of surfaces

1.3212 Friction Type

Static - Stationary (no move)

Sliding - duh!

Rolling - duh!

fluid - liquid (ex. garden hose)  
gas (air) ex. sky diving  
plastic ex. magma

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- air resistance - fluid friction

↑ force on ↓ objects

- terminal velocity -

Force of air resistance = weight  
of object

## 1st Law of Motion

Inertia - resistance to  
 $\Delta$  of motion

$\uparrow$  mass  $\rightarrow$   $\uparrow$  inertia

$\downarrow$  mass  $\rightarrow$   $\downarrow$  inertia

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## 2nd Law of Motion

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

$$F = mA$$

$$F = (5\text{kg})(18\frac{\text{m}}{\text{s}^2})$$

$$F = 90\text{ N}$$

$$F = mA$$

$$\frac{15\text{N}}{7} = \frac{(\cancel{7\text{kg}})(A)}{7}$$

$$2.1\frac{\text{m}}{\text{s}^2} = A$$

$$F = mA$$

$$\frac{12\text{N}}{10} = m(\frac{10\text{m}}{\text{s}^2})$$

$$1.2\text{ kg} = m$$



P. 356 3rd Law of Motion!

- The total momentum of a system is conserved.

$$mV_b = MV_a$$

$$(60 \text{ kg})(3 \frac{\text{m}}{\text{s}}) = 180 \text{ kg}(V)$$

$$\frac{180 \text{ kg m}}{180} \frac{\text{m}}{\text{s}} = \frac{180 V}{180}$$

$$1 \frac{\text{m}}{\text{s}} = V$$