

I. An object's motion
won't change unless an
outside, unbalanced force
acts on it.

$$\text{II. } F = ma$$

force = mass \times acceleration

$$N \leftarrow \frac{\text{kg} \cdot \text{m}}{\text{s}^2} = \text{kg} \times \frac{\text{m}}{\text{s}^2}$$

$$\text{or: } \frac{F}{a} = m$$

Gravitational force

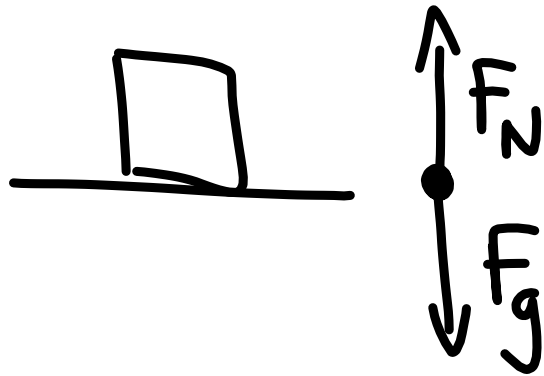
$$F = mg$$

9.81 $\frac{m}{s^2}$ or $\frac{N}{kg}$

III. When two objects interact, they exert equal forces in opposite directions

Normal Force -

Perpendicular force provided by a surface



The Holey Bucket

$$m_b = 3.00 \text{ kg}$$

$$g = 9.81 \frac{\text{m}}{\text{s}^2}$$

$$v_c = 1.50 \frac{\text{m}}{\text{s}}$$

5.00 L = Capacity of
Bucket


$$\text{leak} = 100.0 \frac{\text{mL}}{\text{s}}$$

$$d = 7.00 \text{ m}$$

$$W = F \cdot s$$

$$W = [m_b g + m_w g - m_e g] \cdot [7]$$

$$W = g [m_b + m_w - m_e] \cdot [7]$$

$$W = g [3.00 + 5.00 - \boxed{}] \cdot [7]$$


$$\frac{100.0 \text{ mL}}{\cancel{1 \text{ s}}} = \frac{1.50 \text{ m}}{\cancel{1 \text{ s}}}$$

$$100.0 \text{ mL} = 1.50 \text{ m}$$

$$\frac{100.0 \text{ mL}}{1.50 \text{ m}} = \frac{x}{1 \text{ m}}$$

$$x = 66.666 \frac{\text{mL}}{\text{m}} \rightarrow 0.066666 \frac{\text{L}}{\text{m}}$$
$$\rightarrow 0.066666 \frac{\text{kg}}{\text{m}}$$

$$W = g [3.00 + 5.00 - 0.066666X] \cdot [X]$$

$$W = \int_0^7 9.81 [3.00 + 5.00 - 0.066666x] dx$$

$$W = 533. \text{ N}\cdot\text{m} \text{ or } 533. \text{ J}$$

$$5.33 \times 10^2 \text{ J} \quad 0.533 \times 10^3 \text{ J}$$

ex 36,340,000

36.340×10^6