

Matter

Density: $d = \frac{m}{V}$

density = $\frac{\text{mass}}{\text{volume}}$

Force and Motion

Average Speed: $s = \frac{d}{t}$

speed = $\frac{\text{distance}}{\text{time}}$

Newton's Second Law: $F = ma$

force = mass \times acceleration

Kinetic Energy: $KE = \frac{1}{2}mv^2$

kinetic energy = $\frac{1}{2}$ mass \times velocity squared

Waves and Light

Wave Speed: $v = f\lambda$

wave speed = frequency \times wavelength

Wave Energy: $E \propto A^2$

energy is proportional to amplitude squared

Units, Constants, and Conversions

Energy: 1 Joule = 1 Newton \cdot meter

Length: 1 m = 100 cm
1 km = 1000 m

Force: 1 Newton = 1 $\frac{\text{kilogram} \cdot \text{meter}}{\text{second}^2}$

Mass: 1 kg = 1000 g

Hertz: 1 Hz = 1 $\frac{\text{cycle}}{\text{second}}$

Volume: 1 L = 1000 mL = 1000 cm³

Acceleration Due to Gravity: $g = 9.8 \frac{\text{m}}{\text{s}^2}$

Water at Room Temperature: 1 mL = 1 cm³ = 1 g