

$$F = m \cdot a$$

$$[F] = [m] \cdot [a]$$

$$[m] = \text{kg}$$

$$a = \frac{dv}{dt}$$

$$v = \frac{ds}{dt}$$

$$[v] = \frac{[s]}{[t]} = \frac{\text{m}}{\text{s}}$$

$$[a] = \frac{[v]}{[t]} = \frac{\frac{\text{m}}{\text{s}}}{\text{s}} = \frac{\text{m}}{\text{s}^2}$$

$$[F] = \text{kg} \cdot \frac{\text{m}}{\text{s}^2} =: 1 \text{ N}$$