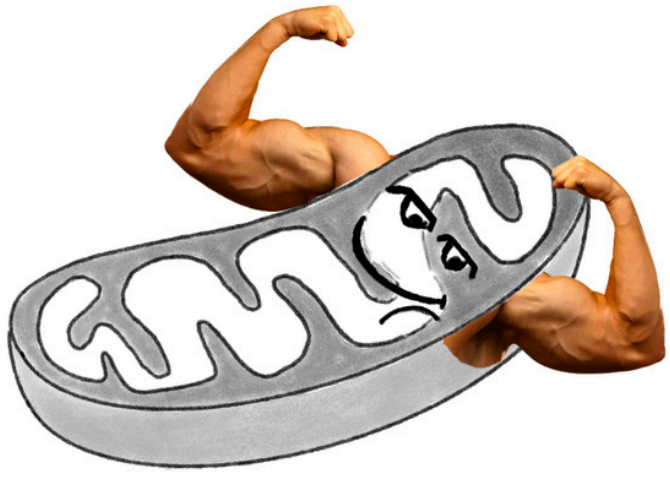
PHYSICS

BASIC WORK & ENERGY

REVIEW



KEY EQUATIONS

$$E_{kinetic} = \frac{1}{2} m v^2$$

$$E_{potential} = mgh$$

$$Work = Fd\cos\theta$$

$$E_{initial} + W = E_{final}$$

m = mass
v = velocity
g = gravitational constant
h = height
F = force
d = displacement
θ = angle btwn force & displacement vectors

→ When do we consider work?

- In conservation of energy work is

$$E_i + W = E_f$$

considered for **non conservative forces**

- **non conservatice force**: work done depends on path taken

  eg: friction, air resistance

QUESTION WALKTHROUGH

A 2kg cart starts at rest on a flat surface. A force does 10J of work on the cart, what is its final speed on the same flat surface?

1. Set up conservation of energy

$$E_i + W = E_f$$

$$E_{pi} + E_{ki} \qquad E_{pf} + E_{kf}$$

→ in this q, only potential & kinetic energy is present

E_p remains constant, as block is on a flat surface ($\Delta h = 0$, so $E_{pi} = E_{pf}$)

2. Plug in values

$$m\frac{v_i^2}{2} + W = m\frac{v_f^2}{2}$$

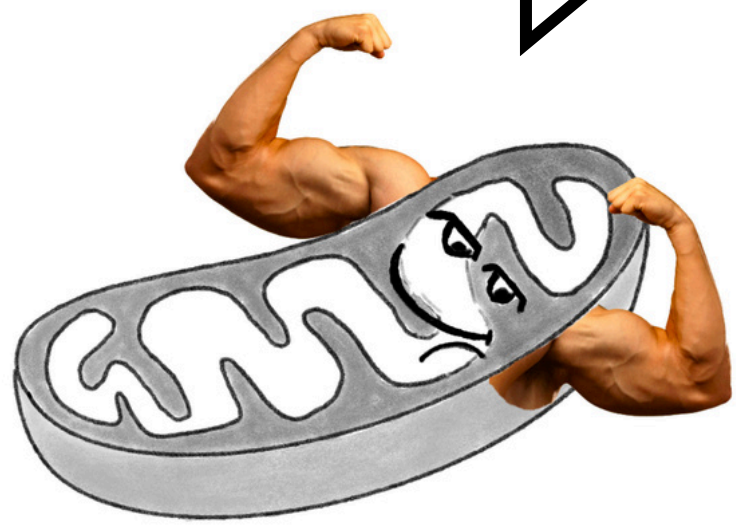
$v_i = 0$ m/s

$W = 10$ J

$$0 + 10\,J = m\frac{v_f^2}{2}$$

$v_f = 3.16$ m/s

follow for more !



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