Work-Energy Theorem

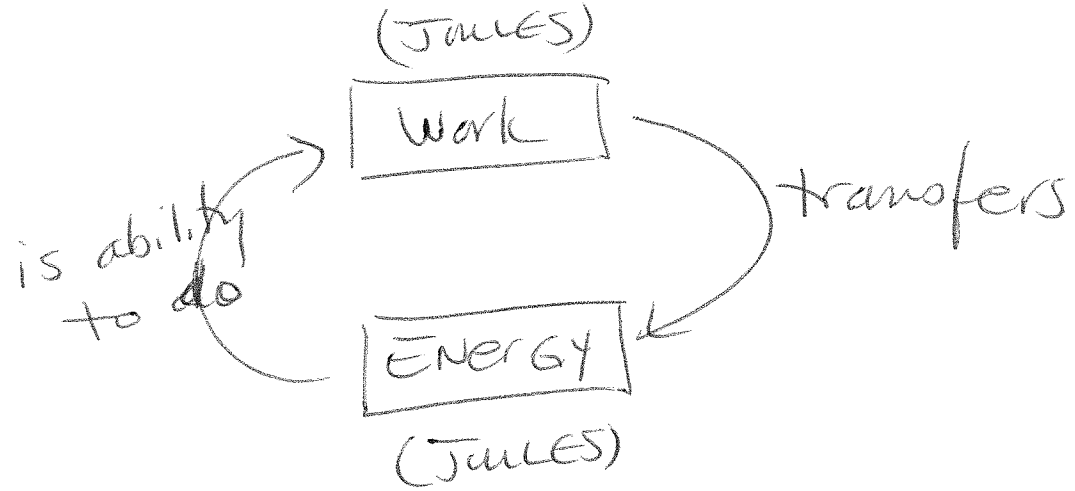
$$W = \Delta E$$

⇓ expanded

$$W = E_2 - E_1$$

if $E_2 - E_1 > 0$
$\therefore +W$

if $E_2 - E_1 < 0$
$\therefore -W$



Work & energy are really opposite sides of the same coin. They are both measured in joules. Sometimes determining the work done on an object can tell us the energy it gains.

ie

$v_0 = 0$ m/s

$m = 54$ kg

$v_1 = 11$ m/s

How much work did the runner do to go from rest to 11 m/s?

$W = ?$ $\quad W = Fd$ is of no use. I don't know force or Δd.

So $W = \Delta E$

$W = E_{K_2} - \cancel{E_{K_1}}^{0}$ $\quad (E_{K_1} = 0!$ $\quad v_1 = 0)$

$W = \frac{1}{2} mv^2$

$= \frac{1}{2}(54)(11)(11)$

$= 3267$ J

The runner did 3.3 kJ of work!