



Flipping Physics Lecture Notes:

Introduction to Mechanical Energy with Friction

Recall that Conservation of Mechanical Energy or $ME_i = ME_f$ is true when $W_{friction} = 0$ and $W_{F_a} = 0$

If $W_{friction} \neq 0$ and $W_{F_a} = 0$ then we use the equation $W_f = \Delta ME$

We can expand the equation: $W_f = \Delta ME \Rightarrow F_f d \cos \theta = ME_f - ME_i$

Note: Because the direction of the force of friction and the displacement of the object are always opposite to one another, the angle in the work equation is 180° .

If $W_{friction} = 0$ then $W_f = \Delta ME \Rightarrow F_f d \cos \theta = ME_f - ME_i \Rightarrow 0 = ME_f - ME_i \Rightarrow ME_i = ME_f$

Conservation of Mechanical Energy is a special case of $W_f = \Delta ME$ where $W_{friction} = 0$

Therefore, remember to always identify the initial and final points and the location of the horizontal zero line whenever using $W_f = \Delta ME$

♥ This is not actually *always* true, however, at the beginning of learning physics it is. I showed one example in the video when it is not true.