

Conservation of Mechanical Energy Lab 8

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Results

For this lab report, we showed the relationship between kinetic and potential energy and revealed the conservation of mechanical energy using an air track and glider. Kinetic and potential energy for a system should always total to the same constant value, modelled by the equation below.

$$E = U + K = Constant$$

where U and K are

$$U = mgy$$

and

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

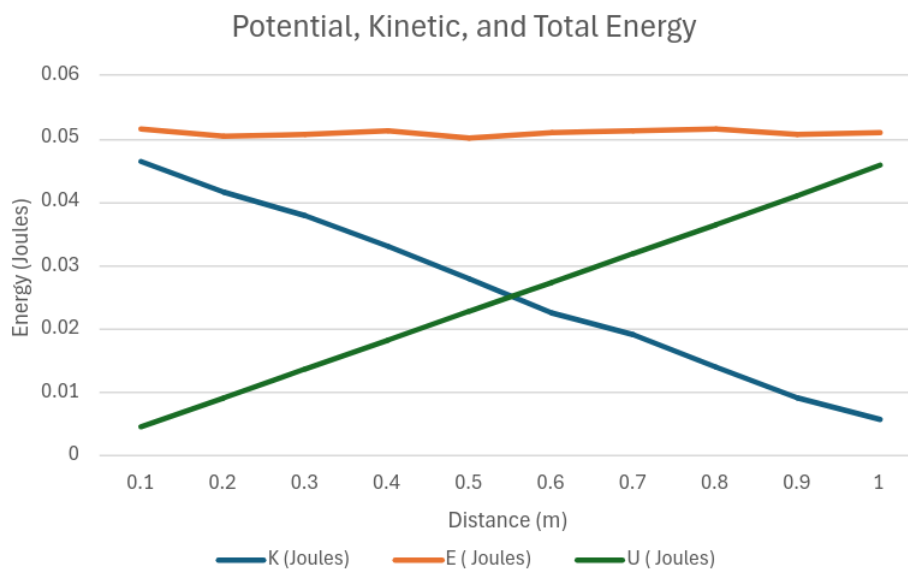
For our results, we created the following graph based on the process of experimentation defined in the manual for the lab. Some potential sources for systematic error for this process were, inaccuracies in placing the photogate timer due to human error, as well as inaccuracies in measuring the various values listed below.

- flag effective width: 0.025 meters ± 0.001 .
- riser block width: 0.02531 meters.
- glider mass: 0.1844 kilograms.

Using the equations noted above, we found the following data table for potential, kinetic, and total energies at different starting heights along the air track.

Distance (meters)	K (Joules)	E (Joules)	U (Joules)
0.1	0.046342	0.0514731	0.004578
0.2	0.041556	0.0503886	0.009157
0.3	0.037855	0.0506505	0.013735
0.4	0.033009	0.051293	0.018314
0.5	0.028034	0.05009	0.022892
0.6	0.022619	0.0509263	0.027471
0.7	0.019244	0.0513232	0.032049
0.8	0.014023	0.0515898	0.036628
0.9	0.009183	0.0507129	0.041206
1	0.005688	0.0509204	0.045785

Based on the columns within this table, we were able to create the graph below



Conclusions

To conclude, based on the above graph, it is clear that total energy (shown in orange) is relatively constant as kinetic energy decreases and potential energy increases. This is consistent with the theory of conservation of mechanical energy as energy is conserved between potential and kinetic states.