**Laboratory Test Even**

Aim: To investigate the loss of energy when a ball is dropped (energy efficiency)  
Hypothesis:

Energy is neither created nor destroyed, but transferred or transformed.

In a controlled closed system where energy does not have the opportunity to transform or transfer, the Gravitational Potential Energy at the maximum height would equal the Kinetic Energy just before impact.

The energy loss in the system, due to air resistance can be calculated comparing the theoretical kinetic energy of different masses with the practical kinetic energy.

The greater the ***mass*** the greater the ***rate of distance*** covered during the object falling and hence the more ***energy efficient***.

Independent Variable: Mass of falling object (kg).

Dependent Variable: Distance (m) and Time (s)

(the dependent variable is what you are measuring to calculate the final velocity and Kinetic Energy)

Controlled Variables: (always a minimum of two listed)

Results:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mass (kg) | Ticker Tape (m) | Time (s) | Initial Velocity (m s-1) | Final Velocity (m s-1) | Calculated Kinetic Energy (J) | Height (m) | Potential Energy (J) | Theoretical Kinetic Energy (J) | Energy Loss | Energy Loss (%) |
| 0.05 | 0.058 | 0.02 | 0 | 2.9 | 0.21 | 1 | 0.49 | 0.49 | 0.28 | 57% |
| 0.1 | 0.068 | 0.02 | 0 | 3.4 | 0.578 | 1 | 0.98 | 0.98 | 0.402 | 41% |

Graph:

Efficiency (%)

Mass (kg)

Discussion:

* Results show that a 50 gram mass is 57% loss in energy and a 100 gram mass has a 41% loss in energy when dropped from a 1 metre height.
* Errors that occurred include…. (trials, more masses, etc)

(as a hint, look at the controlled variables and see if any of those were affected)

* Methods on improving the results
* The hypothesis “the greater the ***mass*** the greater the ***rate of distance*** covered during the object falling and hence the more ***energy efficient***”, was proven correct as the results showed that as the mass increased there was less of a loss of energy before impacting with the ground.

Conclusion:

The results of the experiment proved that as the mass increases, then there is less of an energy loss. There were some errors that occurred during the experiment and with the limited number of trials, and the fact that the energy losses range from 40% to 60%, then it is concluded that even though there is conclusive evidence of energy losses, the results are needing further evaluation.