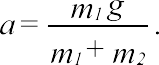
# Experiment 6 Newton's Second Law



g = 9.80665

m\_glider = 1 (mass of the glider)

m1 and m2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group Number | *m*1  (grams) | mass added to glider (grams) | Timing Interval (sec) | *m2*  (grams) |
| 1 |  |  |  |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| data point | time, multiples of | distance,  s | change in distance | Average velocity | Value of tangent  slopes in position  graph from  GraphAnalysis |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |
| 6 |  |  |  |  |  |
| 7 |  |  |  |  |  |
| 8 |  |  |  |  |  |
| 9 |  |  |  |  |  |
| 10 |  |  |  |  |  |
| 11 |  |  |  |  |  |
| 12 |  |  |  |  |  |
| 13 |  |  |  |  |  |
| 14 |  |  |  |  |  |
| 15 |  |  |  |  |  |

Graph the values of instantaneous velocity versus time, with velocity as the ordinate and

4time as the abscissa. Draw two lines that best fit the data: one with maximum slope, , and one



with minimum slope, . Find the slopes of these lines. The best value for the acceleration of the system is then



and the corresponding uncertainty in the acceleration is



Calculate the best value for the acceleration, (4) and the uncertainty, (5).

On a one-dimensional graph, use points and error bars to plot . Be sure to displace vertically the error bar from the axis so that it is clearly visible. Now calculate the theoretical value of the acceleration from (3) and plot it on the graph described above so that the point is displaced slightly above the error bar.

Report in a results table, and the theoretical value of .

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| uncertainty |  |  |  |  | theoretical |
|  |  |  |  |  |  |