Fan Car Acceleration Lab

Sam Tsai

Purpose: Our group is trying to find out the data for the acceleration of the car with weight and without the weight. Also we inclined the slope with high and low to find out the acceleration with the force applied.

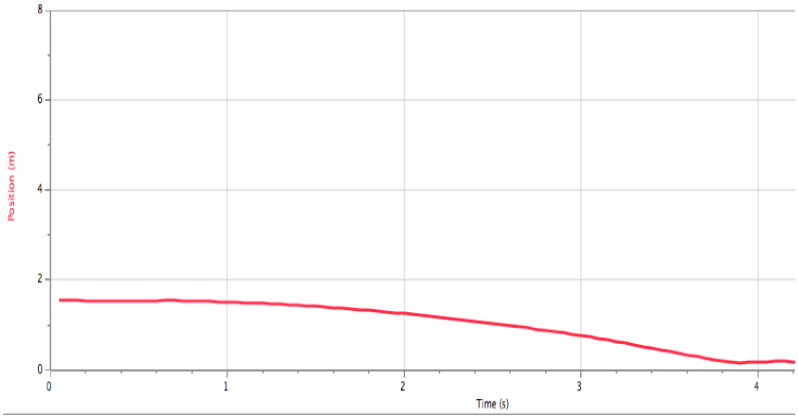
Background: The Newton Law explains that when force is applied constantly, the object should move for the constant time. We are trying to figure out that if this law applies by using fan car with high and low speed, also with high and low inclined slope.

Materials: Laptop
Fan Cart
Stapler for weight use
Sound Reflector
Sonar system
Inclined Plane
Floor

Procedure:
1. Use floor for the flat surface.
2. Turn the fan on to low and use the sonar system to get the data.
3. Repeat this step.
4. Use a inclined plane for slope.
5. Use sonar to get data when car is released
6. Repeat this steps.

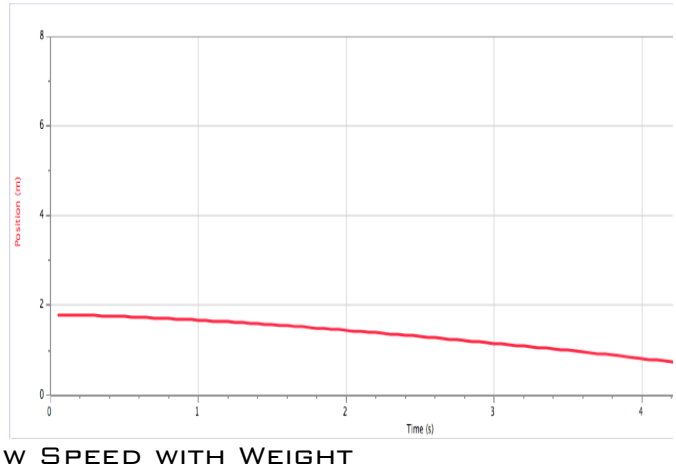
Data:

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.548	−0.011
2	0.10	1.547	−0.011
3	0.15	1.548	−0.025
4	0.20	1.545	−0.034
5	0.25	1.544	−0.034
6	0.30	1.541	−0.030
7	0.35	1.541	−0.014
8	0.40	1.540	0.001
9	0.45	1.540	0.025
10	0.50	1.544	0.025
11	0.55	1.544	−0.004
12	0.60	1.540	0.020
13	0.65	1.547	0.026
14	0.70	1.545	−0.016
15	0.75	1.545	−0.051
16	0.80	1.541	−0.101
17	0.85	1.534	−0.124
18	0.90	1.528	−0.129
19	0.95	1.521	−0.136
20	1.00	1.514	−0.146
21	1.05	1.507	−0.163
22	1.10	1.498	−0.174
23	1.15	1.489	−0.173
24	1.20	1.482	−0.194
25	1.25	1.469	−0.217
26	1.30	1.459	−0.223
27	1.35	1.447	−0.233
28	1.40	1.435	−0.228
29	1.45	1.424	−0.221
30	1.50	1.415	−0.246
31	1.55	1.400	−0.287
32	1.60	1.385	−0.304
33	1.65	1.369	−0.302
34	1.70	1.355	−0.304
35	1.75	1.339	−0.317
36	1.80	1.323	−0.333
37	1.85	1.306	−0.342



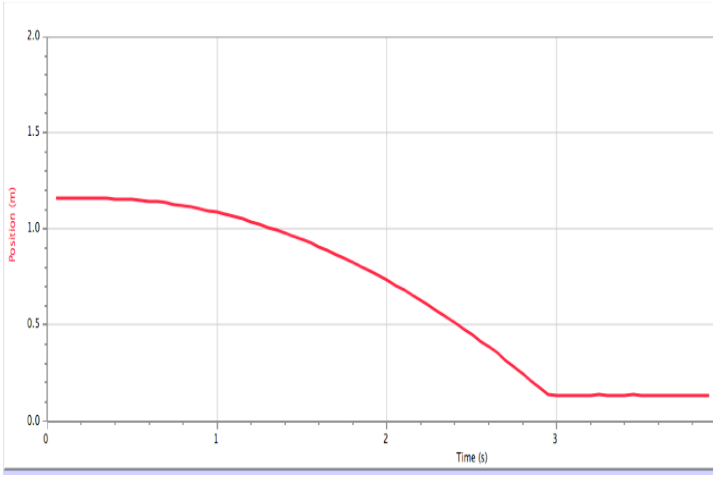
Fast Speed with Weight

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.792	−0.106
2	0.10	1.784	−0.064
3	0.15	1.788	−0.068
4	0.20	1.778	−0.082
5	0.25	1.777	−0.056
6	0.30	1.776	−0.083
7	0.35	1.769	−0.102
8	0.40	1.764	−0.097
9	0.45	1.760	−0.105
10	0.50	1.754	−0.126
11	0.55	1.747	−0.137
12	0.60	1.740	−0.145
13	0.65	1.732	−0.149
14	0.70	1.725	−0.152
15	0.75	1.717	−0.158
16	0.80	1.709	−0.162
17	0.85	1.701	−0.163
18	0.90	1.693	−0.170
19	0.95	1.684	−0.178
20	1.00	1.675	−0.182
21	1.05	1.666	−0.184
22	1.10	1.657	−0.191
23	1.15	1.647	−0.199
24	1.20	1.637	−0.205
25	1.25	1.626	−0.208
26	1.30	1.616	−0.209
27	1.35	1.606	−0.214
28	1.40	1.594	−0.223
29	1.45	1.583	−0.225
30	1.50	1.572	−0.230
31	1.55	1.560	−0.239
32	1.60	1.548	−0.241
33	1.65	1.536	−0.245
34	1.70	1.524	−0.253
35	1.75	1.510	−0.255
36	1.80	1.498	−0.257
37	1.85	1.485	−0.263



Slow Speed with Weight

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.160	0.000
2	0.10	1.159	0.001
3	0.15	1.160	0.000
4	0.20	1.160	−0.003
5	0.25	1.159	−0.003
6	0.30	1.160	−0.011
7	0.35	1.159	−0.025
8	0.40	1.157	−0.035
9	0.45	1.155	−0.045
10	0.50	1.152	−0.059
11	0.55	1.149	−0.072
12	0.60	1.145	−0.084
13	0.65	1.141	−0.099
14	0.70	1.136	−0.123
15	0.75	1.129	−0.152
16	0.80	1.119	−0.158
17	0.85	1.112	−0.150
18	0.90	1.106	−0.179
19	0.95	1.094	−0.206
20	1.00	1.084	−0.210
21	1.05	1.074	−0.223
22	1.10	1.062	−0.238
23	1.15	1.050	−0.253
24	1.20	1.037	−0.267
25	1.25	1.023	−0.281
26	1.30	1.009	−0.295
27	1.35	0.994	−0.308
28	1.40	0.978	−0.325
29	1.45	0.961	−0.341
30	1.50	0.944	−0.352
31	1.55	0.926	−0.364
32	1.60	0.907	−0.379
33	1.65	0.888	−0.394
34	1.70	0.868	−0.410
35	1.75	0.847	−0.423
36	1.80	0.826	−0.436
37	1.85	0.804	−0.451



Low Inclined Slope

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.548	−0.011
2	0.10	1.547	−0.011
3	0.15	1.548	−0.025
4	0.20	1.545	−0.034
5	0.25	1.544	−0.034
6	0.30	1.541	−0.030
7	0.35	1.541	−0.014
8	0.40	1.540	0.001
9	0.45	1.540	0.025
10	0.50	1.544	0.025
11	0.55	1.544	−0.004
12	0.60	1.540	0.020
13	0.65	1.547	0.026
14	0.70	1.545	−0.016
15	0.75	1.545	−0.051
16	0.80	1.541	−0.101
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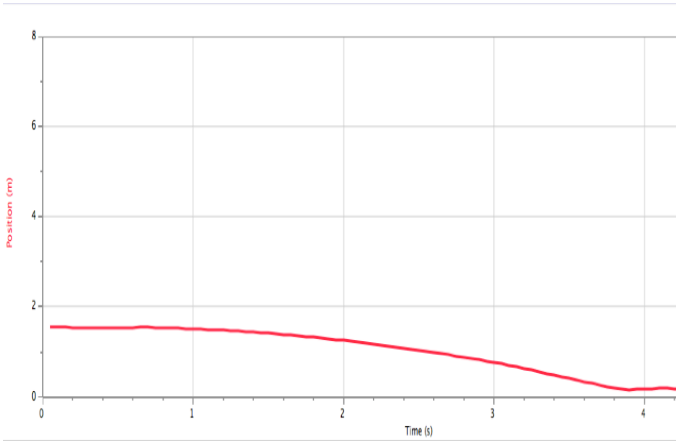
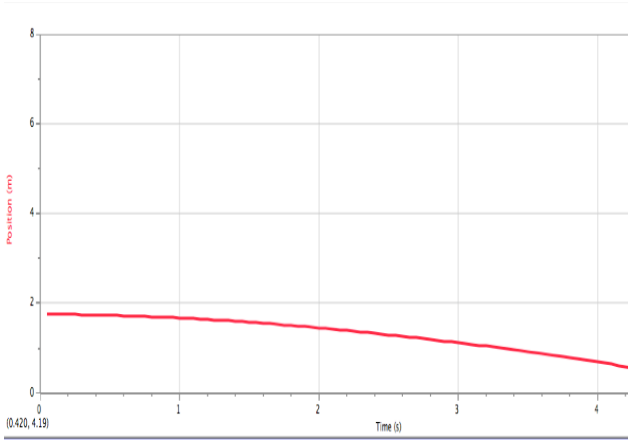


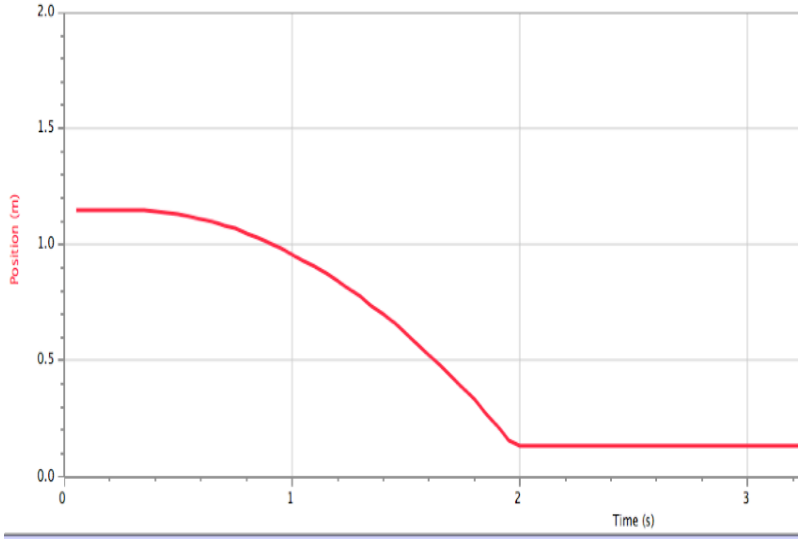
Fast Without the Weight

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.759	-0.026
2	0.10	1.758	-0.031
3	0.15	1.756	-0.038
4	0.20	1.754	-0.045
5	0.25	1.752	-0.051
6	0.30	1.749	-0.058
7	0.35	1.746	-0.065
8	0.40	1.742	-0.069
9	0.45	1.739	-0.076
10	0.50	1.735	-0.084
11	0.55	1.730	-0.091
12	0.60	1.726	-0.097
13	0.65	1.721	-0.102
14	0.70	1.716	-0.109
15	0.75	1.710	-0.116
16	0.80	1.704	-0.120
17	0.85	1.698	-0.126
18	0.90	1.692	-0.135
19	0.95	1.684	-0.148
20	1.00	1.676	-0.154
21	1.05	1.669	-0.157
22	1.10	1.661	-0.163
23	1.15	1.653	-0.169
24	1.20	1.644	-0.175
25	1.25	1.635	-0.183
26	1.30	1.626	-0.190
27	1.35	1.616	-0.199
28	1.40	1.606	-0.214
29	1.45	1.594	-0.222
30	1.50	1.583	-0.225
31	1.55	1.572	-0.233
32	1.60	1.560	-0.242
33	1.65	1.548	-0.246
34	1.70	1.536	-0.257
35	1.75	1.522	-0.271
36	1.80	1.508	-0.278
37	1.85	1.494	-0.279



Slow Without the Weight

	Latest		
	Time (s)	Position (m)	Velocity (m/s)
1	0.05	1.150	0.018
2	0.10	1.152	0.009
3	0.15	1.151	0.001
4	0.20	1.151	-0.004
5	0.25	1.151	-0.015
6	0.30	1.150	-0.034
7	0.35	1.148	-0.063
8	0.40	1.144	-0.098
9	0.45	1.139	-0.137
10	0.50	1.131	-0.187
11	0.55	1.119	-0.218
12	0.60	1.108	-0.223
13	0.65	1.098	-0.254
14	0.70	1.084	-0.303
15	0.75	1.067	-0.343
16	0.80	1.049	-0.380
17	0.85	1.029	-0.417
18	0.90	1.007	-0.452
19	0.95	0.984	-0.488
20	1.00	0.959	-0.529
21	1.05	0.930	-0.546
22	1.10	0.904	-0.567
23	1.15	0.874	-0.611
24	1.20	0.843	-0.647
25	1.25	0.810	-0.682
26	1.30	0.775	-0.717
27	1.35	0.738	-0.752
28	1.40	0.699	-0.788
29	1.45	0.659	-0.828
30	1.50	0.617	-0.877
31	1.55	0.571	-0.907
32	1.60	0.525	-0.921
33	1.65	0.479	-0.947
34	1.70	0.431	-0.978
35	1.75	0.382	-1.019
36	1.80	0.330	-1.075



High Inclined Slope

Weight: 198 grams

Car weight: 255 grams

Observation: When the car was released in the high sloped area, the car was moving faster than the low sloped one with greater acceleration. When we used weight, the car was not moving as fast as without the weight. But I think that if we let the car go for long time, the car with the weight will go faster than without the weight.

Analysis: Our data was not that accurate due to some errors that occurred during the experiment. However, for the sloped data, we had good graph since there were no errors for that.

Conclusion: Errors occurred during the experiment were that we did not use flat surface. Also we did not check for the batteries in the car that turned out the car was not moving so fast and gave us inaccurate data. Also the car did not move straight because our car was not in good condition. To fix these errors, make sure that you are using good condition car and flat surface area. Also check if the batteries are charged.