

Physics 1100 - Newton's 2nd Law

Because we used different equipment from that used in your lab manual, our masses will be different.

Instead of using five 20 gram weights, we used five 10 gram weights. The mass of our hook was 5 grams while the mass of our cart was 271 grams. The following table is a record of what was done in the video.

Part I		
Run	Hanging mass (kg)	Cart mass (kg)
1	15	271+40
2	25	271+30
3	35	271+20
4	45	271+10
5	55	271

In the lab manual, the equipment they used only allows for six data points (there are only six photo-gate timers). If their procedure is to be used, one may choose to use any of the six data points in each Run to represent the position of a timer along with the time it would have displayed.

Data points for Run #1	
Position (m)	Time (s)
0.0628	0.960
0.0725	1.000
0.0826	1.040
0.0936	1.080
0.1054	1.120
0.1177	1.160
0.1305	1.200
0.1439	1.240
0.1584	1.280
0.1735	1.320
0.1890	1.360
0.2052	1.400
0.2220	1.440
0.2397	1.480
0.2580	1.520
0.2768	1.560
0.2964	1.600
0.3166	1.640
0.3374	1.680
0.3586	1.720

Data points for Run #2	
Position (m)	Time (s)
0.0983	0.960
0.1140	1.000
0.1306	1.040
0.1482	1.080
0.1670	1.120
0.1872	1.160
0.2083	1.200
0.2305	1.240
0.2537	1.280
0.2782	1.320
0.3039	1.360
0.3304	1.400
0.3580	1.440
0.3867	1.480
0.4167	1.520
0.4475	1.560
0.4792	1.600
0.5125	1.640
0.5464	1.680
0.5816	1.720

Data points for Run #3	
Position (m)	Time (s)
0.0633	0.640
0.0786	0.680
0.0952	0.720
0.1131	0.760
0.1328	0.800
0.1541	0.840
0.1772	0.880
0.2014	0.920
0.2272	0.960
0.2548	1.000
0.2840	1.040
0.3143	1.080
0.3463	1.120
0.3802	1.160
0.4152	1.200
0.4517	1.240
0.4899	1.280
0.5297	1.320
0.5709	1.360
0.6135	1.400

Data points for Run #4	
Position (m)	Time (s)
0.0366	0.400
0.0500	0.440
0.0654	0.480
0.0827	0.520
0.1020	0.560
0.1234	0.600
0.1470	0.640
0.1726	0.680
0.1998	0.720
0.2294	0.760
0.2610	0.800
0.2944	0.840
0.3300	0.880
0.3677	0.920
0.4070	0.960
0.4485	1.000
0.4920	1.040
0.5374	1.080
0.5847	1.120
0.6343	1.160

Data points for Run #5	
Position (m)	Time (s)
0.0192	0.040
0.0303	0.080
0.0441	0.120
0.0603	0.160
0.0788	0.200
0.0999	0.240
0.1237	0.280
0.1499	0.320
0.1784	0.360
0.2092	0.400
0.2429	0.440
0.2790	0.480
0.3172	0.520
0.3581	0.560
0.4015	0.600
0.4473	0.640
0.4956	0.680
0.5462	0.720
0.5993	0.760
0.6549	0.800

The following data is for the section in your manual that is headed, '*MORE DATA*'.

450 grams is placed on top of our cart (which is 271 g). Attached to the other end of the string is the 5 g hook along with a 10 g weight. The cart is released and the following data is collected.

Data points for " <i>the other part of Newton's 2nd Law</i> "	
Position (m)	Time (s)
0.0495	0.800
0.0551	0.840
0.0610	0.880
0.0672	0.920
0.0735	0.960
0.0803	1.000
0.0873	1.040
0.0945	1.080
0.1020	1.120
0.1097	1.160
0.1179	1.200
0.1262	1.240
0.1350	1.280
0.1441	1.320
0.1534	1.360
0.1630	1.400
0.1729	1.440
0.1831	1.480
0.1935	1.520
0.2042	1.560