Science
Mini lab report

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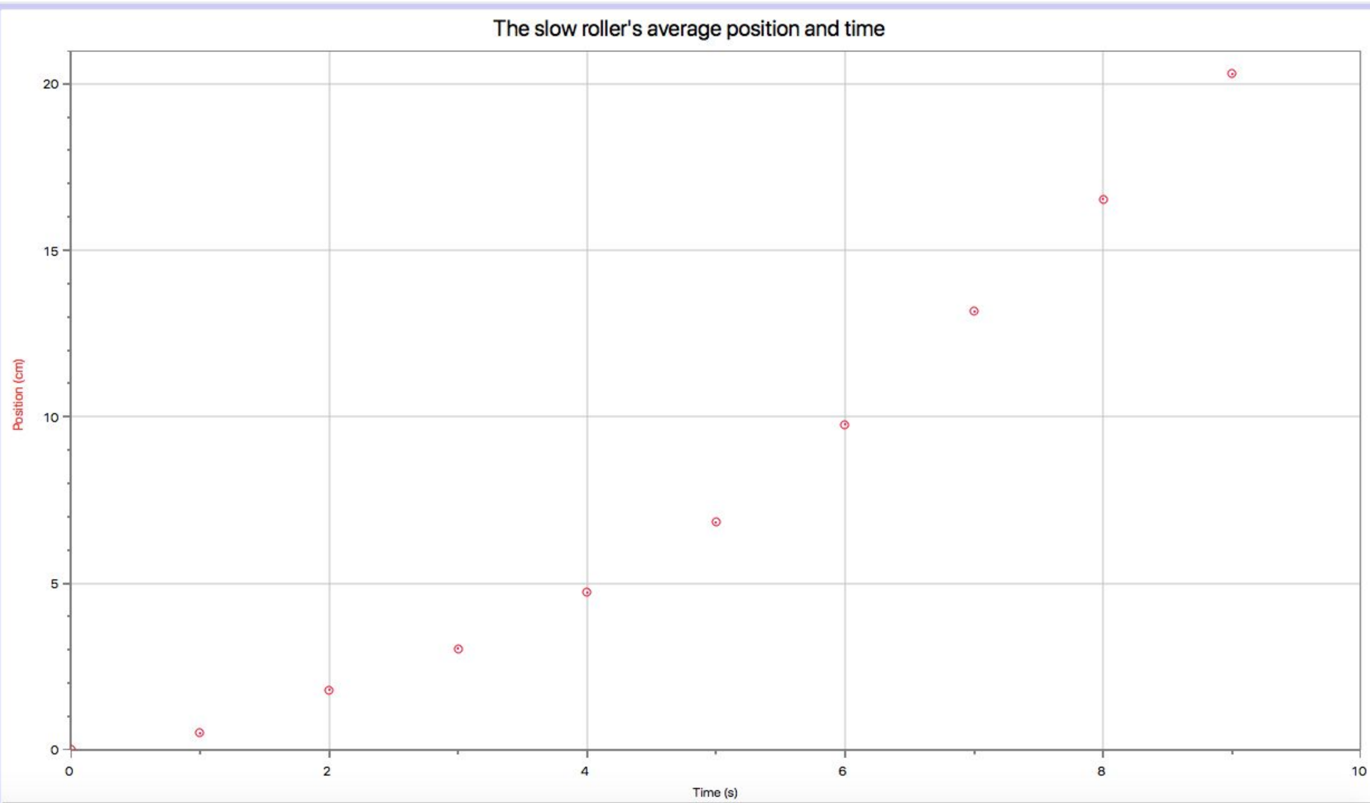
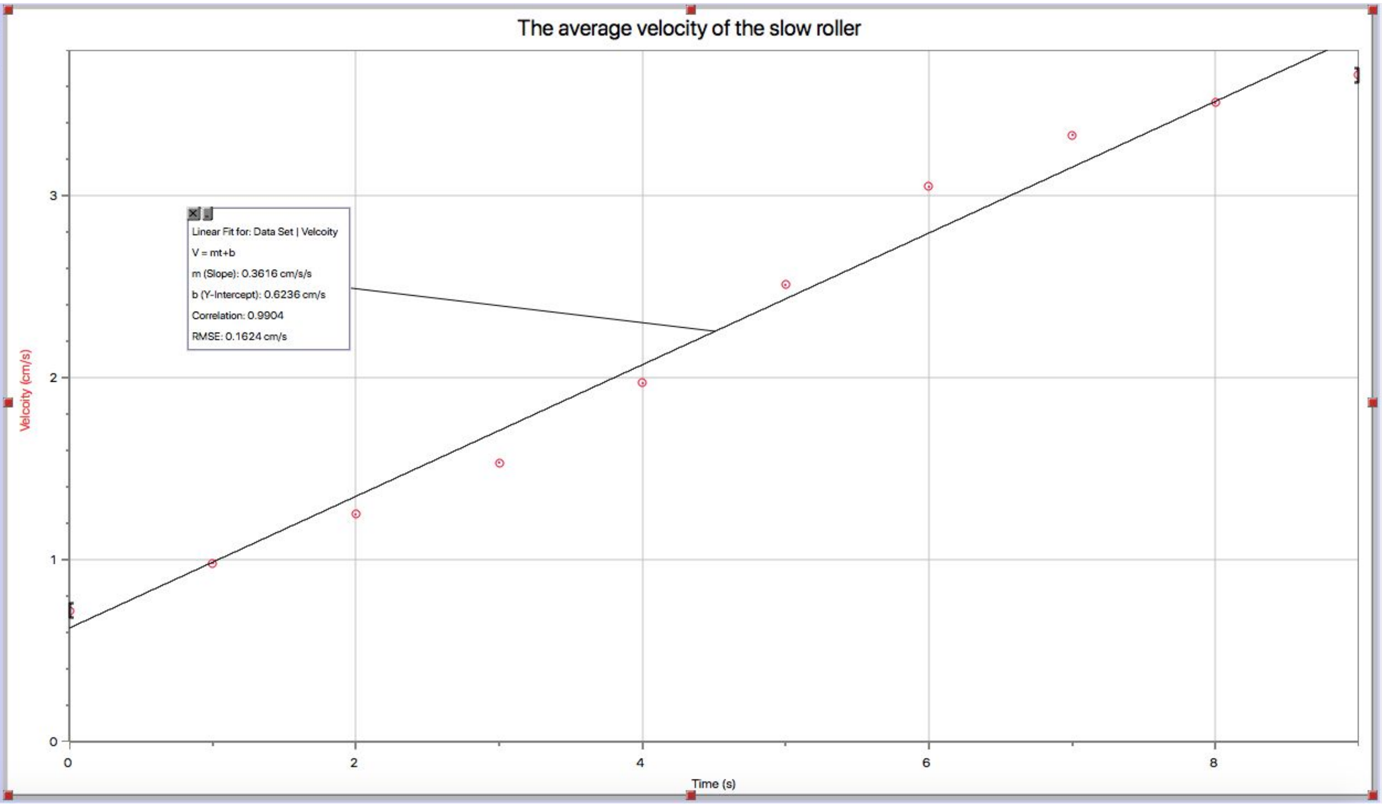
The Relation Between the Position and Velocity

In this lab in order to observe the acceleration of an object we used something called a slow roller, which was two CDs on a axil that we put on a ramp and rolled down. In order to calculate the position of the slow roller we used a marker to mark on a sheet of paper placed above it it's position at every second. We used the slow roller because it accelerated at a very slow rate so we could observe the increase in velocity more easily and gather more data points. With this data we then created a uniform acceleration model that we can now use to calculate an object's instantaneous velocity, if it is uniform.

	Data Set	
	Time (s)	Position (cm)
1	0	0
2	1	0.5
3	2	1.8
4	3	3.033333
5	4	4.733333
6	5	6.833333
7	6	9.766666
8	7	13.16666
9	8	16.53333
10	9	20.3



	Time (s)	Velcoity (cm/s)
1	0	0.72
2	1	0.98
3	2	1.25
4	3	1.53
5	4	1.97
6	5	2.51
7	6	3.05
8	7	3.33
9	8	3.51
10	9	3.66



$$V_f = \left(\frac{\frac{0.36cm}{1s}}{1s}\right)t + \frac{0.62cm}{1s}$$

In the position time graph it shows that after each second the slow roller was travelling a larger distance than the last time, the displacement between points grew as time went on. The first points show this because from 0 to 1 seconds the displacement is 0.5cm and then from 1 to 2 seconds the displacement is 1.3cm, and from 2 to 3 seconds the displacement is 1.7cm. This data indicates that the slow roller doesn’t have a constant velocity, for if it did then the data would be linear, because the slope is the constant velocity and the slowroller doesn’t have a slope.This means that the slow roller is accelerating because it travels a greater distance then the time before.

The velocity time graph data is linear and matches closely to the data points which are linear, and a straight line in the velocity time graph means that the slow roller is accelerating at a uniform rate. The data illustrates that the velocity is changing and is not ever the same as before, and if it was the same, the data would form a horizontal line, showing it has a constant velocity. From 0 to 1 seconds the change in velocity is $\frac{0.26cm}{1s}$ and then from 6 to 5 seconds the change in velocity is $\frac{0.28cm}{1s}$. The slight difference in data is because of human error but the data is still really close. This proves that the velocity is linear, accelerating by the same amount each second. The best fit line equation shows that for every second, t, the slow roller accelerated $\frac{\frac{0.36cm}{1s}}{1s}$ and that the initial velocity was $\frac{0.62cm}{1s}$ and if you plug in t with a time you will get the instantaneous velocity at that time.