Tyler Emp
9-6-15

Hot Wheels Part 2 Lab

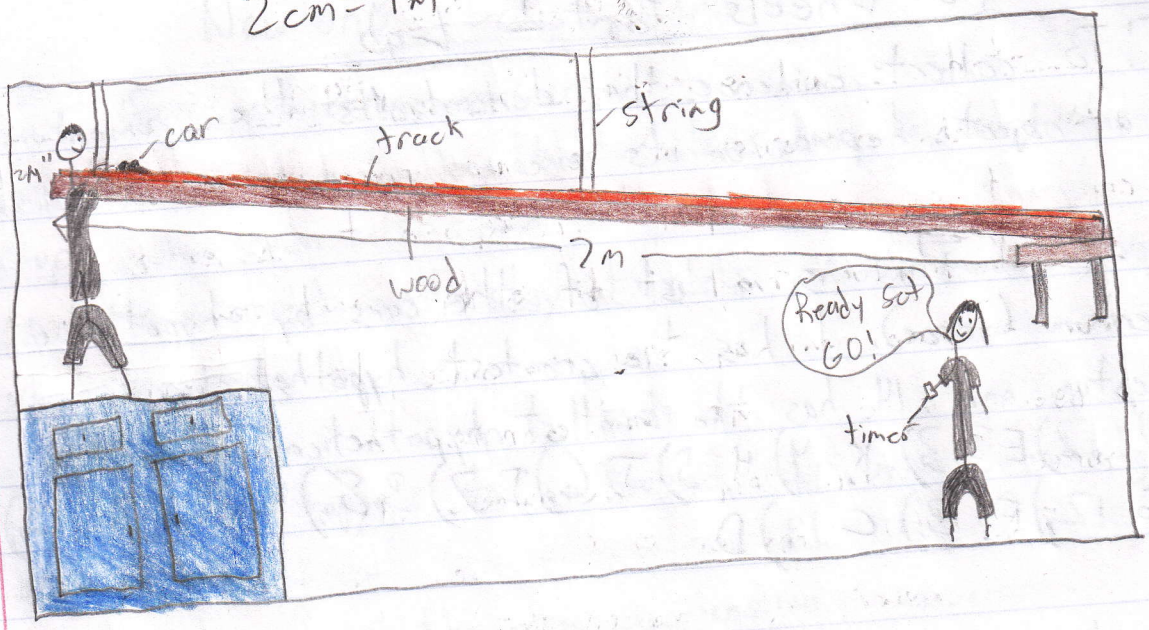
LT: To collect evidence that demonstrates the momentum of an object depends on it's mass and speed.

Hypothesis: This is a list of the cars by hypothetical momentum (force). 1 has the greatest hypothetical momentum and 14 has the smallest hypothetical momentum.
1) N 2) E 3) K 4) H 5) J 6) I 7) B 8) M 9) A 10) L 11) G 12) F 13) C 14) D

Materials: wood, car track, 14 hot wheels cars, timer, string ceiling

Procedure:
1. Have the timer person count off and when they say go, release car A down the track.
2. Once the car passes the end of the track the timer will stop the timer.
3. The time it took to go down the track will be what you record on the 1st trial.
4. Record how fast it went down the track 3 times for each car. A-N or 1-14
5. Find the total by adding each trial up for each car.
6. Divide each total by 3 to get the average and record that. With the average you can figure everything else.

2cm = 1m.



Data/Results/Observations

Hot Wheels Hypotheitcal and Actual Momentum Data

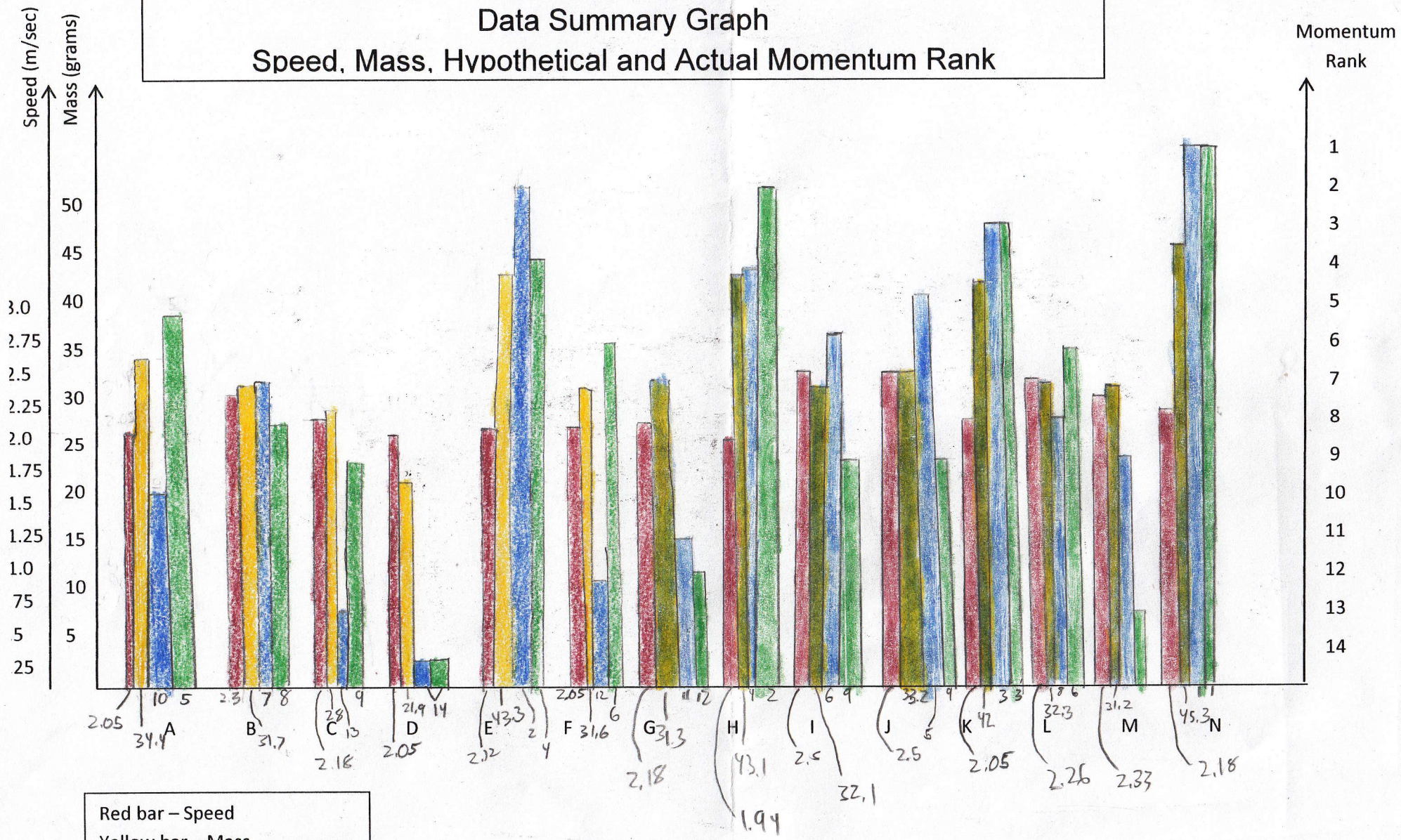
Car	Time trials (seconds) Trial 1	Trial 2	Trial 3	Total	Average	Speed* meters/sec	Mass grams	Hypothetical Momentum* velocity X grams	Rank	Actual Distance block moved (mm)	Rank
A	3.4	3.5	3.3	10.2	3.4	2.05	34.4	70.52	10	63	5
B	2.9	3.2	3.0	9.1	3.03	2.31	31.7	73.23	7	53	8
C	3.3	3.1	3.3	9.7	3.2	2.18	28.0	61.04	13	50	9
D	3.3	3.5	3.3	10.1	3.4	2.05	21.9	44.89	14	34	14
E	3.1	3.4	3.4	9.9	3.3	2.12	43.3	91.79	2	80	4
F	3.2	3.4	3.7	10.3	3.4	2.05	31.6	64.78	12	54	6
G	3.4	2.9	3.3	9.6	3.2	2.18	31.3	68.23	11	46	12
H	3.8	3.7	3.4	10.9	3.6	1.94	43.1	83.61	4	88	2
I	2.7	2.9	3.0	8.6	2.8	2.5	32.1	82.75	6	50	9
J	2.9	2.9	2.8	8.6	2.8	2.5	33.2	83	5	50	9
K	3.2	3.5	3.4	10.1	3.4	2.05	42	86.1	3	86	3
L	3	3.3	2.9	9.2	3.1	2.26	32.3	72.99	8	54	6
M	2.9	3.1	2.9	8.9	3	2.33	31.2	72.69	9	45	13
N	2.9	3.2	3.4	9.5	3.2	2.18	45.3	98.75	1	97	1

*Velocity *Force

Name Tyler Empson

Date 9-6-13 Period 4

Hot Wheels Lab: Part 2
Data Summary Graph
Speed, Mass, Hypothetical and Actual Momentum Rank



Red bar – Speed

Yellow bar – Mass

Blue bar - Hypothetical Rank

Green bar – Actual Rank

Hot Wheels Lab Part 2 Analysis

Momentum is the force, that is calculated by velocity (speed) x mass. In our lab we did time trials of 14 cars (A-N) going down a track. We timed each car going down the track 3 times for each car. Then we weighed each car to find the mass. We multiplied the speed x mass to get our hypothetical momentum and rank. Then we raced the cars into a block to calculate the actual momentum by mesuring the mm that the block moved. We compared our hypothetical to the actual and they were farely close. Our best car that had the most momentum in our hypothetical weighed 45.3g. and we figured that it was 98.75 for the momentum. The actual momentum was 97 and the rank was still 1. So that one stayed the same. Our worst one weighed 21.9g. Our hypothetical momentum was 44.89. The actual momentum was 34. So this shows that the more mass there is the faster it will go so the momentum is higher. Now if we used a different block for each car then the hypothetical and actual momentum wouldn't match up. For this we used the same block that weighed 267g. To get an accurate set of data you need to use the same block each time.

Conclusion

Our purpose was to collect evidence that demonstrates the momentum of an object depends on it's mass and speed. I accept my hypothesis because the actual momentum was farely close to the hypothetical. Most of the ranks were the same or close together, only 2 were sort of outliers. I learned that the mass and speed can really affect the momentum of an object. I wonder how much mass it would take to move the 267 g. block down to the bottom of the track.