Momentum and Impact

With Vernier Go Direct Sensor Carts

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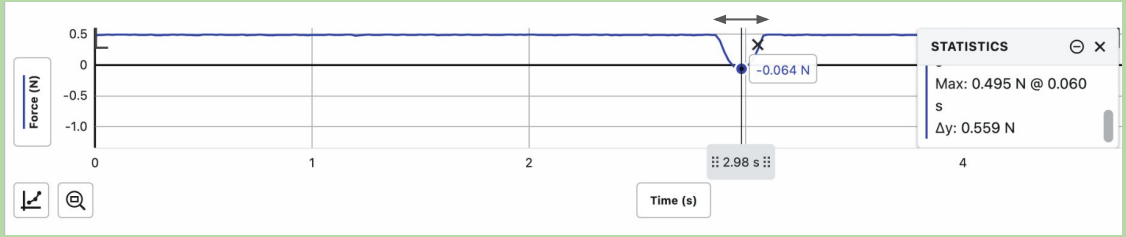
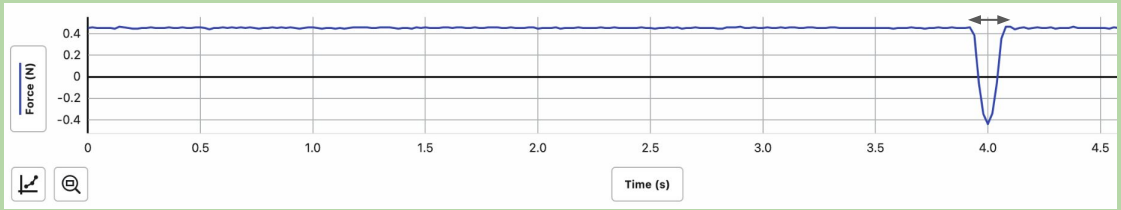
Investigation 1-B

Thick		Thin	
Initial velocity	Δ Force	Initial velocity	Δ Force
0.145 m/s	0.817 N	0.155	0.559 N
0.156	0.854 N	0.130	0.504 N
0.151	0.903 N	0.142	0.485 N





If impulse-momentum theorem is true, the amount of time taken to change the direction of the cart should have **an inverse relationship** with the amount of force exerted by the hoop onto the cart.

By extension, the thicker hoop that has **MORE** push-back on the cart, should take **less time** when compared to the thinner hoop.

Investigation 2-D

$$m_G v_{0\,G} + m_Y v_{0\,Y} = m_G v_{F\,G} + m_Y v_{F\,Y}$$

Ideally, in an **elastic collision** the sum of the initial velocities should equal the sum of the final velocities **if momentum is conserved**

	Green		Yellow		Sum of:	
Trial #	Initial (m/s)	Final (m/s)	Initial (m/s)	Final (m/s)	Initial Velocities	Final Velocities
1	-0.343	0.283	0.312	-0.307	-0.031	-0.024
2	-0.392	0.282	0.305	-0.354	-0.087	-0.072
3	-0.297	0.318	0.34	-0.267	0.043	0.051