Conservation of Momentum Lab

Can you find the Pattern?

**Purpose**: Compare momentum before and after a collision in ELASTIC and INELASTIC Collisions

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**Calculate Momentum Before AND Momentum After**---**Directions:** Set up simulation as picture indicates, run it, then calculate momentum of EACH object BEFORE and AFTER the collision—Show all work and units! Remember momentum is mass X velocity.

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| --- | --- | --- | --- | --- |
| **Car Set-up--ELASTIC** | **Momentum *Before*****Red** | **Momentum *Before*****Blue** | **Momentum *After*****Red** | **Momentum *After*****Blue** |
|  |  |  |  |  |
| **Car Set-up--ELASTIC** | **Momentum *Before*****Red** | **Momentum *Before*****Blue** | **Momentum *After*****Red** | **Momentum *After*****Blue** |
|  |  |  |  |  |
| **Car Set-up--ELASTIC** | **Momentum *Before*****Red** | **Momentum *Before*****Blue** | **Momentum *After*****Red** | **Momentum *After*****Blue** |
|  |  |  |  |  |

**Can you find the Pattern?--**What pattern do you notice comparing the momentum BEFORE to the momentum AFTER in an **elastic** collisions?

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**NOW TRY AN INELASTIC COLLISION**

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| **Car Set-up--INELASTIC** | **Momentum *Before*****Red** | **Momentum *Before*****Blue** | **Momentum of the ENTIRE object** **(once they have stuck together)** |
|  |  |  |  |
| **Car Set-up--INELASTIC** | **Momentum *Before*****Red** | **Momentum *Before*****Blue** | **Momentum of the ENTIRE object** **(once they have stuck together)** |
|  |  |  |  |

**Can you find the Pattern?--**What pattern do you notice comparing the momentum BEFORE to the momentum AFTER in an **elastic** collisions?

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**Application of the Law of Conservation of Momentum**

* A 7 kg cannon ball is fired from a cannon with an exit velocity of 30 m/s. Explain what has to happen to the cannon as the cannonball is being fired using what you have learned about the Law of Conservation of Momentum.