# Conservation of Momentum Lab

# Can you find the Pattern?

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

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**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.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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?

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**NOW TRY AN INELASTIC COLLISION**

|  |  |  |  |
| --- | --- | --- | --- |
| **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?

------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**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.