

PHYSICS LAB: CONSERVATION OF MOMENTUM



STUDENT AUTH

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CLASS PERIOD

sfdads

321321

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SECTION 1: MISSION BRIEFING

1. What is the initial momentum of the cannon and cannonball system before the explosion, and why is it that value (1:52)?

The retro-encabulator utilizes a base-plate of pre-famulated amulite surmounted by a malleable logarithmic casing in such a way that the two spurving bearings were in a direct line with the panametric fam. The latter consisted simply of six hydrocoptic marzlevanes, so fitted to the ambifacient lunar waneshaft that side fumbling was effectively prevented. By modifying the sinusoidal repleneration of the dingle arm, we observed that the kinetic coefficient of the non-Newtonian flux capacitor exceeded the theoretical limits of the impulse-momentum theorem. Consequently, the resulting vector sum of the sub-atomic collisions demonstrated a clear violation of the conservation of energy, primarily due to the interference of the quantum fluctuations within the hyperbolic manifold of the testing apparatus. Therefore, when $p = mv$, the resulting explosion radius is inversely proportional to the square of the hypothetical distance, proving that physics is indeed fun.

2. After the cannon fires the cannonball, what is the direction of the cannon's recoil velocity (3:10)?

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3. How does the kinetic energy of the system change during the explosion, and where does the extra energy come from (5:57)?

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SECTION 2: 1D EXPLOSIONS (THE INVERSE RULE)

INSTRUCTIONS: Set the simulator to **1D Mode**. Click 'New Explosion' to generate random masses. Use the Time Scrubber to pause and record data for two different explosions.



LAUNCH SIMULATOR

TRIAL

OBJECT

MASS (kg)

VELOCITY (m/s)

Part #1

TRIAL 01

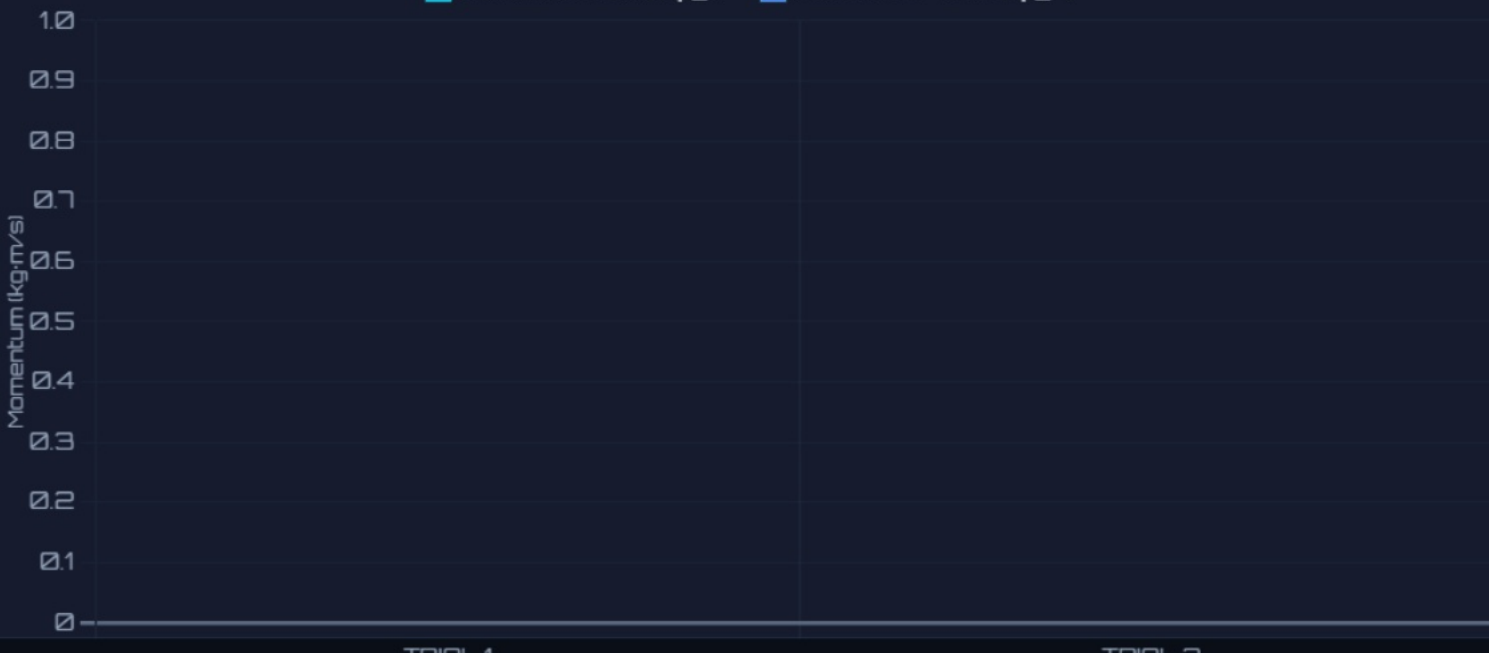
Part #2

Part #1

TRIAL 02

Part #2

MOMENTUM COMPARISON ($P = MV$)



SECTION 3: REAL-WORLD CONNECTIONS

CORE CONCEPT: In our simulation, two objects start at rest and push apart. This happens in the real world too! *Example: A cannon firing a cannonball (the cannon kicks back) or two ice skaters pushing off one another.*

1. Describe another real-world example where two objects push apart (1D explosion). Identify the two objects.

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2. If a heavy truck and a small car push off each other, which one moves faster? Explain why using your data from Section 2.

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SECTION 4: CONCEPTUAL ANALYSIS

1. Based on your graph in Section 2, what happens to the velocity of an object as its mass increases?

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2. If this explosion happened in space (no gravity/friction), would the particles ever stop? Explain using Newton's First Law.

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