

Momentum & Collisions

Name: _____ Date: _____

LEARNING OBJECTIVE

The student will experiment with rolling ball or marble collisions to observe how momentum transfers between objects of different mass and speed.

MATERIALS NEEDED

- 2-3 marbles or small balls of different sizes/mass
- a flat table or floor
- ruler or measuring tape
- paper
- pencil
- masking tape to mark a starting line

HANDS-ON ACTIVITY

1. Mark a starting line with tape on a flat table or floor, and place a stationary marble or ball a fixed distance away as the 'target.'
2. Roll a same-size marble from the starting line to strike the stationary target marble head-on, and measure how far the target marble travels after being struck.
3. Repeat two more times for consistency and average the distance traveled by the target.
4. Now roll a larger/heavier marble or ball at a similar speed into the same stationary target, and measure and average how far the target travels this time.
5. Compare results and record which collision transferred more motion (momentum) to the target marble.

QUESTIONS

1. Which rolling object (the same-size marble or the larger/heavier one) caused the stationary target to travel farther?
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2. What is momentum, and what two factors determine how much momentum a moving object has?
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3. Why did you try to roll each marble at a similar speed for both trials?

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4. Using the idea of momentum transfer, explain why being hit by a slow-moving truck can be more dangerous than being hit by a fast-moving tennis ball.
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