

Momentum: Marble Collision Investigation

Name: _____ Date: _____

LEARNING OBJECTIVE

Students will investigate how mass and velocity affect momentum through collisions.

MATERIALS NEEDED

- marbles or balls of different sizes
- a ruler or flat track (book or board)
- measuring tape

HANDS-ON ACTIVITY

1. Set up a flat, smooth track with a starting line marked at a fixed distance from a stationary target marble or ball.
2. Roll a marble from the starting line into the stationary target and measure how far the target travels after impact; repeat 3 times and average the results.
3. Repeat using a larger/heavier marble or ball rolled at a similar speed, measuring how far the same target travels; average 3 trials.
4. Record data in a table: Rolling object, Mass (light/heavy), and Average distance target traveled.
5. Write a conclusion sentence about how the mass of the moving object affected the distance the target traveled, relating this to momentum equals mass times velocity.

QUESTIONS

1. What is the formula for momentum?

2. In your test, which rolling object caused the target to travel farther, and why does this make sense with the momentum formula?

3. If you doubled the velocity of the rolling marble instead of its mass, what would you predict about momentum?

4. **Why is it important to roll each marble with a similar force or speed when testing the effect of mass?**
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