

Momentum Lab

The headlines declare "Chicago Bulls Gaining Momentum." The coach pumps up his team at half-time, saying "You have the momentum; the critical need is that you use that momentum and bury them in this third quarter."

Momentum is a commonly used term in sports. A team that has the momentum is on the move and is going to take some effort to stop. A team that has a lot of momentum is really on the move and is going to be hard to stop. Momentum is a physics term; it refers to the quantity of motion that an object has. A sports team that is on the move has the momentum. If an object is in motion (on the move) then it has momentum.

Momentum can be defined as "mass in motion." All objects have mass; so if an object is moving, then it has momentum - it has its mass in motion. The amount of momentum that an object has is dependent upon two variables: how much stuff is moving and how fast the stuff is moving. Momentum depends upon the variables mass and velocity. In terms of an equation, the momentum of an object is equal to the mass of the object times the velocity of the object.

LINEAR MOMENTUM

$$P = mv$$

MOMENTUM EQUALS THE
MASS MULTIPLIED BY
THE VELOCITY
OF THE OBJECT

OBJECTIVE: Design a lab and that proves that momentum depends on both mass and velocity.

MATERIALS: Marbles of various sizes and masses, ramps, books, wooden blocks, masking tape, stop-watches... and ask if you need anything else.

REQUIREMENTS: (Lab report must be completed using pages on your macs)

- Data table - Titled and labeled with proper units. Be sure to include your constants along with your data table.
- Graph - Again, titled and labeled properly. You may want to do two separate graphs to display your data.
- Conclusion - summarize the experiment and how it "clearly" shows that momentum depends on mass and velocity.

