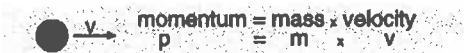


Momentum and Impulse.

Unit II – Chapter 7
Physical Science - Physics

Momentum

- Momentum – Inertia in motion.
- Momentum – mass & movement.
 - No movement = no momentum.
- Momentum (p) = mass times velocity
 $p = mv$



Momentum

- Suppose a roller skate and truck were rolling down the same hill.

Practice Question:

Can you think of a case where the roller skate and the truck (shown in Figure 7.1) would have the SAME momentum?

Momentum

- Momentum can change by changing the mass and/or the velocity of an object.

The more force on an object...

The faster the object will go...

The more momentum you have...

Impulse

- Impulse (I) – The change in momentum.
- Calculate: Force multiplied by time.

$$I = F\Delta t$$

Impulse = change in momentum...

$$I = \Delta p$$

$$F\Delta t = mv$$

The longer it takes the change the momentum of an object, the larger the impulse.

Impulse

Practice Question:

Which would give you a larger impulse: Hitting a concrete wall or hitting a padded wall?

Previously on...

Summarize:

- 1. Momentum = Inertia in motion.

$$p = mv$$

- 2. Impulse = Change in momentum.

$$I = Ft$$

- 3. Overall Equation:

$$Ft = \Delta mv$$

Section II – Conservation.

- The Law of Conservation of Momentum.

“In the absence of an external force, the momentum of a system remains unchanged”

$$\text{Momentum}_{\text{Before}} = \text{Momentum}_{\text{After}}$$

$$m_{\text{Before}} v_{\text{Before}} = m_{\text{After}} v_{\text{After}}$$

Section III – Collisions.

- When two objects hit each other...

| Elastic Collision | Inelastic Collision |
|---|--|
| When two objects collide, the objects will bounce off each other. | When two objects collide, the objects will stick together. |
| Ex. Billiard Balls | Ex. Football Tackle |

