

2.1 Momentum

Momentum is a vector quantity with the same direction as the object's velocity.

You need to remember the differences between speed and velocity.

Speed

- Speed is the distance covered per unit time
- Speed is a scalar quantity (thus has magnitude and no direction).
- Symbol: v

Velocity

- Velocity is the rate at which an object is displaced.
- Velocity is a vector (thus has magnitude and direction).
- Symbol: \vec{v}



The formula for momentum is: $p = mv$

- where
- p = momentum
- m = mass
- v = velocity
- mass is measured in kilograms (kg)
- velocity is measured in $\text{m}\cdot\text{s}^{-1}$
- the unit of momentum is: $\text{kg}\cdot\text{m}\cdot\text{s}^{-1}$

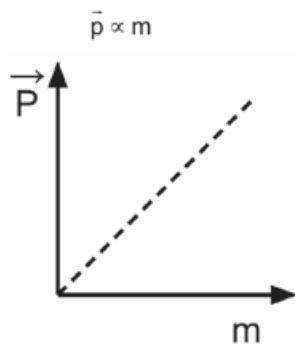
Conservation means to keep things (forces) the same (in a closed system).

Linear momentum refers to the momentum of objects in a straight line.
A closed system is a system that does not experience any external forces.



The **momentum** of an object is defined as the product of its mass and velocity ($\vec{p} = m \vec{v}$)

Momentum is **directly proportional** to the **mass** of the object:



Momentum is also **directly proportional** to the **velocity** of the object:

