Physics

Momentum

Momentum is something that all moving objects have

If something is

- **heavy then it has more momentum**
- **fast then it has more momentum**
- **heavy and fast have lots of momentum**

Example

- **a big rugby player running fast has huge momentum**
- **a skinny men walking slowly has very little momentum**

Formula of momentum

Momentum= mass x velocity

Momentum is represented by letter p

P = m x v

Where p is Momentum M is mass and v is velocity

Examples

example one

50 kg Cheetah starts running at speed 60 m/s
what is the momentum

P = 50 x 60 = 3000kg m/s

Conservation of momentum

This is very important

- in a closed system Momentum before is equal to Momentum after

A closed system means

- Nothing from outside pushes
- no external force
- only the objects in the system interact

Momentum cannot appear or disappear
It can only moves from one object to another

Snooker example

Before collision

- Red ball is not moving Momentum is zero
- white ball is moving so Momentum is p= mv

After collision

- Red ball moves now it has momentum
- White ball slows down and has less momentum

Total Momentum after collision is equal to total Momentum before collision

Momentum is shared but not lost

Car crash example

A moving car bumps into a parked car

Before

Only first car has Momentum the car that is moving

parked car has zero momentum

After

Cars locked together

both moves slowly together

the total Momentum stays the same even though

- **mass increased**
- **speed decreased**

Explosion example

Before explosion

whole object is still so it has Zero momentum

After explosion

- **pieces fly in different directions**
- **but total Momentum adds to zero because some pieces go left and some goes right**

So if Momentum before is zero, Momentum after must be zero