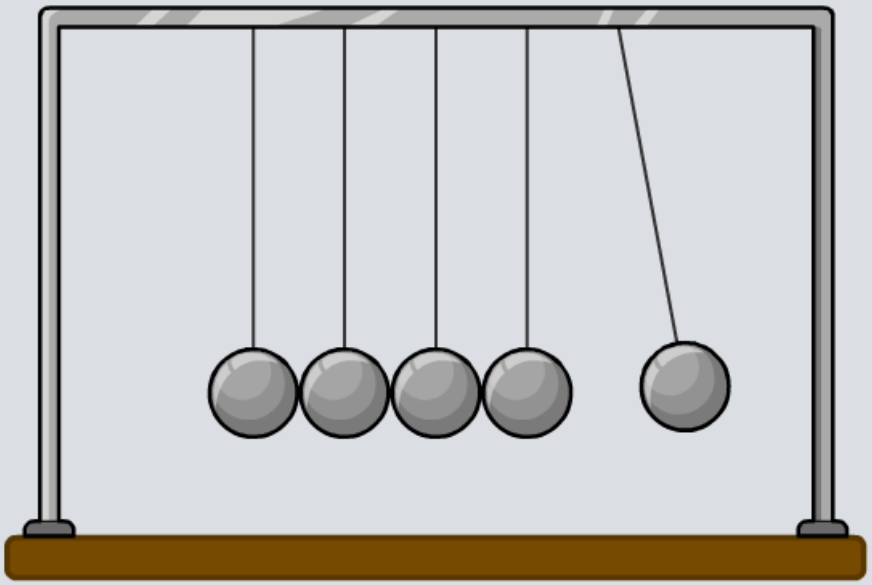
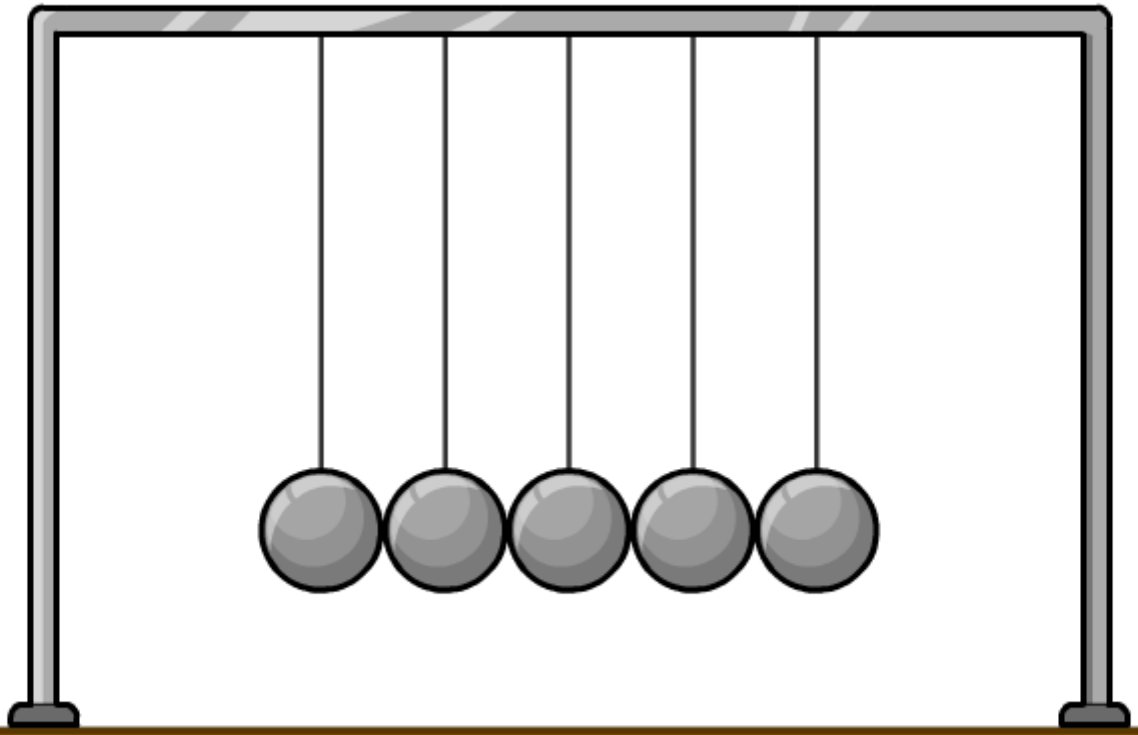
Conservation of Momentum



What does a Newton's cradle show about momentum?



What is conservation of momentum?

If two objects collide or interact, the forces acting on each one will be the same size but in opposite directions. The same is true for the change in momentum of each object.

This means that the momentum lost by one of the objects will be gained by the other object. Therefore, whenever two objects collide or interact, **momentum is conserved**.

Using conservation of momentum

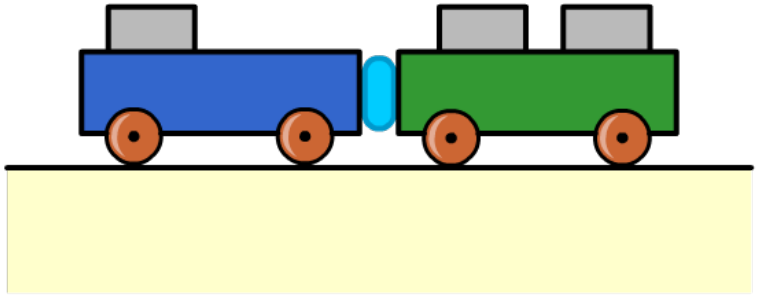
How is momentum conserved?

The principle of conservation of momentum can be used to calculate the velocity of an object after it has interacted with another object.

Click "**play**" to find out how.

Conservation of momentum question

Two trolleys collide and stick together. From the data below, calculate the velocity of the trolleys after the collision.



trolley A

mass = 3 kg

velocity = 8 m/s

momentum = 3 × 8

= 24 kg m/s

trolley B

mass = 5 kg

velocity = –4 m/s

momentum = 5 × –4

= –20 kg m/s

total momentum before collision = 24 + –20 **=** 4 kg m/s

mass after collision = 3 + 5 = 8 kg

momentum after collision = 4 kg m/s

velocity after collision = momentum / mass = **0.5 m/s**

Investigating momentum

Momentum and velocity of colliding trolleys

The trolleys will not collide at present

trolley A		trolley B	
mass (kg)	select	mass (kg)	select
velocity (m/s)	select	velocity (m/s)	select
momentum (kg m/s)		momentum (kg m/s)	

Momentum in explosions

What happens to momentum in an explosion?

The principle of conservation of momentum can be applied to explosions.

Click the bomb or "**start**" to find out more.