

OCR A-Level Physics

3.5 Newton's laws of motion and momentum

Flashcards

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If an object is in equilibrium it means the
object is...



If an object is in equilibrium it means the object is ...

Not accelerating; it is either:

- Stationary
- Moving at a constant velocity



Which of Newton's Laws state 'every action force has an equal and opposite reaction force'



Which of Newton's Laws state 'every action force has an equal and opposite reaction force'

Newton's third law.



What is Newton's second law?



What is Newton's second law?

$$F = ma$$

The resultant force of an object is proportional to the rate of change of momentum of the object and in the same direction.



What is Newton's first law?



What is Newton's first law?

An object at rest or moving with constant velocity will stay that way unless a resultant force acts upon it.



What is the difference between elastic and inelastic collisions?



What is the difference between elastic and inelastic collisions?

In an elastic collision, the kinetic energy before is equal to the kinetic energy afterwards – no energy is lost.

However, in an inelastic collision, the kinetic energy at the end is not equal to the kinetic energy at the start – some energy is lost to the surroundings.



Give an equation that can be used to calculate momentum.



Give an equation that can be used to calculate momentum.

$$\textit{momentum} = \textit{mass} \times \textit{velocity}$$



True or false: linear momentum is only conserved in elastic collisions.



True or false: linear momentum is only conserved in elastic collisions.

False, linear momentum is always conserved.



The rate of change of momentum can also be described as...



The rate of change of momentum can also be described as...

Resultant force.



What is impulse?



What is impulse?

The change in momentum:

$$F\Delta t = \Delta(mv)$$



What does the area underneath a
force-time graph stand for?



What does the area underneath a force-time graph stand for?

Impulse, the change in momentum.



What is meant by the principle of conservation of energy?



What is meant by the principle of conservation of energy?

Energy cannot be created or destroyed, only transferred into other forms of energy.

Therefore the total energy in a closed system would always remain the same.



What is the equation used for the principle of conservation of momentum in one-dimensional collisions?



What is the equation used for the principle of conservation of momentum in one-dimensional collisions?

$$m_1 u_1 + m_2 u_2 = m_1 v_1 + m_2 v_2$$

