PHYSICS · YEAR 11 · MODULE 2

Dynamics

PH11-9

3 inquiry questions · 12 dot points

1 How are forces produced between objects and what effects do forces produce?

- explore the concept of net force and equilibrium in one-dimensional and simple two-dimensional contexts using:...
- solve problems or make quantitative predictions about resultant and component forces by applying the following relationships:...
- conduct a practical investigation to explain and predict the motion of objects on inclined planes

2 How can the motion of objects be explained and analysed?

- apply Newton's first two laws of motion to a variety of everyday situations, including both static and dynamic examples, and include the role played by friction $\vec{f}_{friction}=\mu\vec{F}_N$
- investigate, describe and analyse the acceleration of a single object subjected to a constant net force and relate the motion of the object to Newton's Second Law of Motion through the use of:...
- apply the special case of conservation of mechanical energy to the quantitative analysis of motion involving:...
- conduct investigations over a range of mechanical processes to analyse qualitatively and quantitatively the concept of average power $P=\Delta E/\Delta t$, $P= F_{\parallel}v=Fv\cos\theta$ including but not limited to:...

3 How is the motion of objects in a simple system dependent on the interaction between the objects?

- conduct an investigation to describe and analyse one-dimensional (collinear) and two-dimensional interactions of objects in simple closed systems
- analyse quantitatively and predict, using the law of conservation of momentum $\sum m\vec{v}_{before}= \sum m\vec{v}_{after}$ and, where appropriate, conservation of kinetic energy $\sum 1/2mv_{before}^2= \sum 1/2mv_{after}^2$, the results of interactions in elastic collisions
- investigate the relationship and analyse information obtained from graphical representations of force as a function of time
- evaluate the effects of forces involved in collisions and other interactions, and analyse quantitatively the interactions using the concept of impulse $\Delta\vec{p}=\vec{F}_{net}\Delta t$
- analyse and compare the momentum and kinetic energy of elastic and inelastic collisions