Subject	Year	Term
Physics	13	1

Topic

Topic 6&12 Further Mechanics and Gravity

Content (Intent)

Prior Learning (Topic) Topic 2 (mechanics), Topic 3 (electricity)

Impulse momentum theorem

CORE PRACTICAL 9: Investigate the relationship between the force exerted on an object and its change of momentum.

Conservation of linear momentum. Collision problems in two dimensions. Elastic and inelastic collisions.

$E_k = \frac{p^2}{2m}$ for the kinetic energy of a non-relativistic particle.

CORE PRACTICAL 10: Use ICT to analyse collisions between small spheres, eg ball bearings on a table top. Radian measure, $2\pi\ rad = 360^o$

Angular displacement, $\theta = s/r$ and angular velocity, $\omega = \Delta\theta/\Delta t = v/r$ Angular frequency, $\omega = 2\pi f$

Circular motion. Centripetal acceleration $a = \frac{v^2}{r} = r\omega^2$

Centripetal force as a resultant force $F = ma = \frac{mv^2}{r} = mr\omega^2$ .Concept of a field.

Radial gravitational field of the Earth Inverse square law Newton's law of gravitation $F = \frac{Gm_1m_2}{r^2}$

Derive and use the equation $g = \frac{Gm}{r^2}$ for the gravitational field due to a point mass $V_{grav} = \frac{-GM}{r}$

How will knowledge and skills be taught? (Implementation)	How will your understanding be assessed & recorded (Impact)
Mathematical requirement: use of vector diagrams to derive equations for centripetal acceleration. Horizontal circles; banked tracks Simple vertical circles.	Homework Booklet 9 marked and written feedback given Test 9 marked, graded and feedback given

How can parents help at home?

Check that the homework booklet 6&12 is completed

Helpful further reading/discussion

Reading	Vocabulary Lists	Careers Links
Advanced Physics for you chapters 5,7,8	*See front of homework booklet*	