

# Curriculum Overview Template

	Focus	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 13 – Pure/Mechanics</b>	<b>Topic</b>	Parametric equations, Further trigonometry	Kinematics in 2D, Equilibrium and resolving. Vectors.	Statics and dynamics, differential equations	Applications of differential equations, Moments	Revision/external exams	External exams
	<b>Key concepts/ideas</b>	Introducing parametric equations, looking at how to sketch and find the gradient of them. Trigonometry: compound and double angle identities, and alternative forms of trigonometric equations.	Taking key concepts from year 1 kinematics and applying them in 2 dimensions. Introducing i and j notation into mechanics. Applying vector knowledge to 3 dimensions. Understanding that any force at any angle is the resultant of horizontal and vertical components.	Applying year 1 knowledge of gravity and forces to cover Projectiles, connected particles in two dimensions, friction, forces on slopes. Understanding rate of change as a differential, and using initial conditions to find constants of integration.	Applying knowledge of differential equations to mechanics. Understanding what a moment is, its units, uses and equilibrium.		
	<b>Key skills</b>	Parametric differentiation, equations of tangents and normal in parametric form. Converting between cartesian and parametric equations.  Derive and use the compound and double angle formulae, using them to solve equations and prove identities. Use of R, $\alpha$ forms to sketch trigonometric curves and solve equations.	SUVAT equations in vector form, variable acceleration in vector form, differentiation and integration of expressions in vector form. Understanding and applying Lami's theorem, resolving forces into vertical and horizontal components. Reinforcing the concept that equilibrium is not the same as stationary.	Splitting velocities into component form, applying knowledge of kinematics in 2D from Autumn 2 to motion under gravity. Using compound/double angle formulae in a mechanics setting. Setting up differential equations from the information given, and solving them using separation of variables. Understanding and using integrational constants, and replacing $e^c$ with A.	Using differential equations in situations involving variable acceleration or variable forces. Can find the moment of a force around a point and can see where to take a moment about in order to simplify a problem.		
	<b>Key terms/vocab</b>	Parametric, cartesian, elimination, substitution, compound angle	Equilibrium, variable, Lami's theorem, component form, resultant	Projectile, components, differential, rate of change, coefficient of friction, $\mu$ ,	Moment, newton metre, reactional force, equilibrium.		
	<b>Independent learning / wider reading</b>	<a href="https://sites.google.com/view/tlmaths/home/a-level-maths/full-a-level/c-coordinate-geometry/c3-parametric-equations">https://sites.google.com/view/tlmaths/home/a-level-maths/full-a-level/c-coordinate-geometry/c3-parametric-equations</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/e-trigonometry/e6-compound-angles-equivalent-forms">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/e-trigonometry/e6-compound-angles-equivalent-forms</a>	<a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q3-suvat">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q3-suvat</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q4-calculus-in-kinematics">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q4-calculus-in-kinematics</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/j-vectors/j5-vector-problems">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/j-vectors/j5-vector-problems</a>	<a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q5-projectiles">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/q-kinematics/q5-projectiles</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r4-newtons-third-law-and-pulleys">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r4-newtons-third-law-and-pulleys</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r6-the-coefficient-of-friction">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r6-the-coefficient-of-friction</a>	<a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/h-integration/h7-differential-equations">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/h-integration/h7-differential-equations</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r5-fma-differential-equations">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/r-forces-and-newtons-laws/r5-fma-differential-equations</a>  <a href="https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/s-moments/s1-moments">https://sites.google.com/view/tlmaths/home/a-level-maths/2nd-year-only/s-moments/s1-moments</a>		
	<b>Assessment</b>	Recap test on all year 1 content	Test on year 2 content studied in this academic year.	Progress exam containing all areas of the course except year 2 statistics	Test on year 2 statistics, and other content not covered in progress exam	External Exams	External Exams
	<b>Careers links</b>	Software developer, animator, economist	Cyber intelligence officer, aerospace engineer, meteorologist	Civil engineer, maths teacher, investment analyst	Mechanical engineer, physicist, entrepreneur		