



YEAR 13 Spring TERM 1

'An ambitious curriculum that meets the needs of all'

Medium Term Planning – Units 4, 9 PURE Binomial Expansion, Differentiation

Medium Term Planning – Unit 4, 5 APPLIED Moments, Forces & Friction

Curriculum Intent

PURE UNIT 4: Binomial Expansion

Skills/Assessment Objective Links

Chapter 4: Binomial expansion

T P23 I can expand $(1 + x)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid

T P24 I can expand $(a + bx)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid

T P25 I can use partial fractions to expand fractional expressions

Prior knowledge

- Binomial Expansion (Y1 PURE Unit 8)
- Partial Fractions (Y2 PURE Unit 1)

PURE UNIT 9: Differentiation

Skills/Assessment Objective Links

Chapter 9: Differentiation

T P48 I can differentiate trigonometric functions

T P49 I can differentiate exponentials and logarithms

T P50 I can differentiate functions using the chain, product and quotient rules

T P51 I can differentiate parametric equations

T P52 I can differentiate functions which are defined implicitly

T P53 I can use the second derivative to describe the behaviour of a function

T P54 I can solve problems involving connected rates of change and construct simple differential equations

Prior knowledge

- Differentiation (Y1 PURE Unit 12)
- Equations of tangents (Y1 PURE Unit 12)
- Parametric Equations (Y2 PURE Unit 8)
- Solve equations using trig identities (Y2 PURE Unit 6)

Learning further developed in the future in:

- Year 2 PURE Unit 11
- Year 2 APPLIED Unit 8

APPLIED UNIT 4: Moments

Skills/Assessment Objective Links

Skills/Assessment Objective Links

Prior Knowledge

Current learning to be developed in the future

Chapter 4: Moments
T S17 I can calculate the turning effect of a force applied to a rigid body
T S18 I can calculate the resultant moment of a set of forces acting on a rigid body
T S19 I can solve problems involving uniform rods in equilibrium
T S20 I can solve problems involving non-uniform rods
T S21 I can solve problems involving rods on the point of tilting

Prior knowledge

- SOHCAHTOA (GCSE)
- Forces under gravity (Y1 APPLIED Unit 10)

Learning further developed in the future in:

- Year 2 APPLIED Unit 7

APPLIED UNIT 5: Forces & Friction

Skills/Assessment Objective Links

Chapter 5: Forces and friction
T S22 I can resolve forces into components
T S23 I can use the triangle law to find a resultant force
T S24 I can solve problems involving smooth or rough inclined planes
T S25 I understand friction and the coefficient of friction
T S26 I can use $F \leq \mu R$

Prior knowledge

- Equations of motion with component vectors (Y1 APPLIED Unit 10)
- Pythagoras and Trigonometry of right-angled triangles (GCSE)

Learning further developed in the future in:

- Year 2 APPLIED Unit 7

Spiritual, moral, social, and cultural development	<p>SMSC: Making choices, looking for patterns which may reflect the natural world, supporting and collaborating with each other, realisation that mathematics is an international language and making cultural links as we explore the history of mathematics.</p> <p>PSHE/British Values: Working collaboratively, being respectful during discussion and valuing contributions made by others</p> <p>Skills Builder: Key skills in numeracy used in all topic areas.</p>
Numeracy	Focus on key skills.
Literacy	<p>Vocabulary Tier 2: Command words displayed in the classroom and italicized/bold font used in shared resources/presentations. These are a constant focus in discussion and questioning,</p> <p>Vocabulary Tier 3: Title slide in all shared resource presentations show the key vocabulary for each topic.</p> <p>Reading: Underlining command words,</p> <p>Writing: Modelling solutions</p> <p>Oracy: Think, pair, share, discussion, verbal feedback (peer to peer), questioning, student modelling</p>
Becoming future ready	<p>Personal Skills: As a Mathematics student you will learn many skills: you will gain opportunities to listen to others supportively and to use questioning to develop your own understanding, you will learn how to cope with challenging questions and how to build up your resilience, you will get the chance to work on your own and with others. You will develop problem solving skills and you will learn how to break a problem down into smaller more manageable steps. You will learn how to collaborate with others when solving problems and you will learn how to articulate your solution to a problem.</p> <p>Employability: Mathematical skills are invaluable in the workplace. There are many transferable skills which are much valued by employers. Specific career paths for each topic are discussed at the beginning of each unit of work.</p>
Adaptation	

QFT/SEND Provision	<ul style="list-style-type: none"> • By progressive questioning: exploring pupils' understanding through interactive dialogue. • By outcome: different learners will produce different outcomes. • By resource: worksheets are clearly presented and accessible. • By intervention: by providing different levels of supervision and support. • By offering optional activities: In class or as homework, to extend learning.
Implementation Curriculum Delivery	See curriculum intent
Learning Outcomes (Knowledge)	
Assessment	Refer to assessment maps for formative and summative assessment opportunities.
Impact	Attainment and Progress – Refer to assessment results / data review documentation.