KEVICC Key Stage 4 Curriculum Subject: Mathematics

Autumn Half-Term

Term: Year 11 Autumn Term – Block Three | **Topic: Sequences (and numerical methods)**

What is the essential knowledge from this unit?
What do students need to remember and understand?

	Specification content	**Specification notes**
A23	Generate terms of a sequence from either a term-to-term or a position-to-term rule	including from patterns and diagrams

Students should be able to:
- generate linear sequences
- work out the value of the *n*th term of a linear sequence for any given value of *n*
- generate sequences with a given term-to-term rule
- generate a sequence where the *n*th term is given
- work out the value of the *n*th term of any sequence for any given value of *n*
- generate simple sequences derived from diagrams and complete a table of results that describes the pattern shown by the diagrams
- describe how a sequence continues.

A24	Recognise and use: sequences of triangular, square and cube numbers simple arithmetic progression Fibonacci type sequences quadratic sequences and simple geometric progressions (r^n where n is an integer and r is a rational number > 0)	other recursive sequences will be defined in the question

Students should be able to:
- solve simple problems involving arithmetic progressions
- work with Fibonacci-type sequences (rule will be given)
- know how to continue the terms of a quadratic sequence
- work out the value of a term in a geometrical progression of the form r^n where *n* is an integer > 0

A24h	Recognise and use: sequences of triangular, square and cube numbers simple arithmetic progression Fibonacci type sequences quadratic sequences and simple geometric progressions (r^n where n is an integer and r is a rational number > 0)	other recursive sequences will be defined in the question

Students should be able to:
- work out the value of the *n*th term of a sequence for any given value of *n*.

A25	Deduce expressions to calculate the nth term of linear **and quadratic** sequences

Students should be able to:
- work out a formula for the *n*th term of a linear sequence
- work out an expression in terms of *n* for the *n*th term of a linear sequence by knowing that the common difference can be used to generate a formula for the *n*th term.

A25h	Deduce expressions to calculate the nth term of linear **and quadratic** sequences

Students should be able to:
- work out a formula for the *n*th term of a sequence, which may contain linear or quadratic parts.

A20	**Find approximate solutions to equations numerically using iteration** including the use of suffix notation in recursive formulae Extension – this topic is covered later as a separate topic – details in scheme of work

Key Vocabulary and notation.

Sequence	Geometric
Term	Fibonacci
Position	n^{th} term
Rule	Common ratio
Term-to-term	Square
	Triangular
Table	Cube
Graph	Oscillate
Axes	Predict
Linear	Simplest form
Non-Linear	Surd
Difference	Common difference
Constant difference	Coefficient
Ascending	Quadratic
Descending	Show
Arithmetic	
Second - difference	

Mathematical questioning should be designed to unpick the structure of the maths and deepen the student's understanding. When students talk about mathematical concepts, they should develop the vital mathematical language that helps them explain their ideas fully.

Students are expected and encouraged to use terminology during all discussions, verbal feedback and in written content.

What prior learning supports understanding of this content?	How does this content link to future learning?
• Generate and describe linear number sequences. • Use simple formulae. • Describe positions on the full coordinate grid (all four quadrants). • Understand multiples. • Understand integer exponents and roots. • Understand and use the conventions and vocabulary of algebra including forming and interpreting algebraic expressions and equations.	• Work with co-ordinates in all four quadrants. • Plot graphs of equations that correspond to straight-line graphs in the coordinate plane; Use the form y = mx + c to identify parallel lines and perpendicular lines. • Find the equation of the line through two given points, or through one point with a given gradient. • Find the equation of a straight line given two points - y = mx + c • Identify and interpret gradients and intercepts of linear functions graphically and algebraically.
Reading: *Where in the unit are students supported to read complex academic text?* • Reading and understanding mathematical questions and problems' – teacher input. • Decoding complex examination questions - explain what they are asking the student to do' – teacher input. • Following instructions to solve problems - break down the tasks – teacher input. • Recognising terminology, numbers, and symbols.	**Writing:** *Independent writing tasks and how they are structured* • Using the correct subject specific terminology for numbers and symbols – examination papers, class books. • Responding to questions that ask for an explanation or a reason – examination papers, class books. • Self-evaluation, reviewing, reflecting and analysis of own work – class books, personalised learning checklists and analysis. • Creating notes that can be used later for revision purposes - class books, revision cards, mind maps etc.

Key assessments:

How will do students review the information learned?

End of block assessments.

AQA end of block assessments provide a quick progress check at the end of each block of learning to make sure students have understood the content being covered. These are available for both foundation and higher tiers.

End of term/year assessments and mock examinations.

End of term assessments assessing the students' progress towards targets and provide diagnostic information to modify future teaching.

End of year 9 and 10 examinations assessing the students' progress towards targets and provide diagnostic information to modify future teaching.

Two mock examinations seasons take place during year 11 using previous years AQA 8300 examination papers. Students to experience the full suite of papers at both Foundation and higher tiers using Non-calculator and Calculator requirements.

All examinations will explore the three examination papers at both foundation and higher tiers using non-calculator and calculator requirements.

How will feedback be seen?

Marked end of block, term assessments and mock examinations.

Personalised learning checklists for all assessments identifying strengths and areas of development.

Written teacher feedback and marking in compliance with faculty and College Marking Policies. Student responses to marking. Students self-mark using purple pen. Verbal feedback given every lesson from teacher and peers as appropriate. Teacher and student self-assessment of presentation of class books will be completed to ensure written work is of high standard and students are achieving their potential.