KEVICC Key Stage 3 Curriculum Subject: Mathematics

Autumn Half-Term 1 Algebraic Thinking

Term: Year 7 Autumn Term – Block One | **Topic:** Sequences

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

The focus of this block is exploring sequences. Rather than rushing to find rules for n^{th} term, the time is spent exploring sequences in detail, using both diagrams and lists of numbers. Technology is used to produce graphs, so students appreciate and use the words 'linear' and 'non-linear' linking to the pattern they have spotted. Calculators are used throughout so number skills are not a barrier to finding the changes between terms or subsequent terms. Sequences are treated more formally later in this unit.

National curriculum content covered:

- Move freely between different numerical, algebraic, graphical and diagrammatic representations.
- Make and test conjectures about patterns and relationships.
- Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
- Generate terms of a sequence from a term-to-term rule.
- Recognise arithmetic sequences
- Recognise geometric sequences and appreciate other sequences that arise.

We know that breaking the curriculum down into small manageable steps should help students to understand concepts better. As a result, for each block of content in the scheme of learning we have provided the following 'small step' breakdown for this unit as follows:

Lesson One - Describe and continue sequences
Lesson Two - Predict and check next term(s)
Lesson Three - Sequences in a table and graphically
Lesson Four - Linear and non-linear sequences
Lesson Five - Continue linear sequences
Lesson Six - Continue non-linear sequences
Lesson Seven - Explain the term-to-term rule
Lesson Eight - Find missing terms (H)

Key terms and Vocabulary.

Sequence	Difference
Term	Constant - difference
Position	Ascending
Rule	Descending
Term-to-term	Arithmetic
Table	Second - difference
Graph	Geometric
Axes	Fibonacci
Linear	
Non-Linear	

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?

- 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.

How does this content link to future learning?

- Generate sequences using more complex rules, e.g. with brackets and squared terms, both in words 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.
- Recognising patterns and relationships in mathematics.

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 students review the information learned?
End of block assessments.
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 covered.
A Core paper – it is envisaged that all students will take this paper, to provide a direct comparison with the performance of the rest of the cohort. All topics from each term will be covered, and the use of a calculator is expected.
End of term assessments.
A Foundation paper – students who are working below national expectations will have the opportunity to show their understanding of the material with more straightforward questions. Non calculator paper.
A Higher paper – students who are working at or above national expectations will have the opportunity to tackle more challenging questions on the same material, plus the extra objectives indicated as "Higher" in our scheme of learning. Non calculator paper.
How will feedback be seen?
Marked end of block and term assessments.
Personalised learning checklists for end of term 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.