KEVICC Key Stage 3 Curriculum Subject: Mathematics

Spring Half-Term 2 Developing Number

Term: Year 8 Spring Term – Block Five | **Topic:** Standard Form

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

Higher strand students have already briefly looked at standard form in Year 7 and now this knowledge is introduced to all students, building from their earlier work on indices last term. The use of context is important to help students make sense of the need for the notation and its uses. The Higher stand includes a basic introduction to negative and fractional indices.

National curriculum content covered:

- Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations.
- Interpret and compare numbers in standard form $A \times 10^n$, $1 \leq A < 10$, where n is a power or negative integer or zero.

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 - Investigate positive powers of 10
Lesson Two - Work with numbers greater than 1 in standard form
Lesson Three - Investigate negative powers of 10
Lesson Four - Work with numbers between 0 and 1 in standard form
Lesson Five - Compare and order numbers in standard form
Lesson Six - Mentally calculate with numbers in standard form
Lesson Seven - Add and subtract numbers in standard form
Lesson Eight - Multiply and divide numbers in standard form
Lesson Nine - Use a calculator to work with numbers in standard form
Lesson Ten - Understand and use negative indices (H)
Lesson Eleven - Understand and use fractional indices (H)

Interleaving/Extension of previous work

- Understand and use surd notation.
- Understand and use negative and simple fractional indices.

Key Vocabulary and notation.

Base	Commutative
Index/indices	Scientific
Power	notation
Exponent	SCI/EXP
Standard	Reciprocal
(index) form	Zero
Negative	Root
Place value	

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?

- Form expressions using indices.
- Understand and use the addition and subtraction rules.
- Explore and use standard index form.

How does this content link to future learning?

- Revisit standard form using the four operators in context.

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.