| KEVICC Key Stage 3 Curriculum Subject: Mathematics | Key Vocabulary and notation. |
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| **Term:** Year 7 Autumn Term – Block Two | **Topic:** Understand & Use Algebraic Notation |
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**What is the essential knowledge from this unit?**
**What do students need to remember and understand?**

The focus of this block is developing a deep understanding of the basic algebraic forms, with more complex expressions being dealt with later. Function machines are used alongside bar models and letter notation, with time invested in single function machines and the links to inverse operations before moving on to series of two machines and substitution into short abstract expressions.

**National curriculum** content covered:

- Move freely between different numerical, algebraic, graphical and diagrammatic representations.
- Use algebra to generalise the structure of arithmetic, including to formulate mathematics relationships.
- Recognise and use relationships between operations including inverse operations.

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** - Given a numerical input, find the output of a single function machine
**Lesson Two** - Use inverse operations to find the input given the output
**Lesson Three** - Use diagrams and letters to generalise number operations
**Lesson Four** - Use diagrams and letters with single function machines
**Lesson Five** - Find the function machine given a simple expression
**Lesson Six** - Substitute values into single operation expressions
**Lesson Seven** - Find numerical inputs and outputs for a series of two function machines
**Lesson Eight** - Use diagrams and letters with a series of two function machines
**Lesson Nine** - Find the function machines given a two-step expression
**Lesson Ten** - Substitute values into two-step expressions
**Lesson Eleven** - Generate sequences given an algebraic rule
**Lesson Twelve** - Represent one- and two-step functions graphically

**Key Vocabulary and notation.**

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| Function | Variable |
| Input | Constant |
| Output | Sequence |
| Estimate | Non-linear |
| Operation | Linear |
| Square | Rule |
| Inverse | Term-to-term |
| Bar Model | Position-to- |
| Variable | term |
| Coefficient | Graph |
| Commutative | Axis |
| Expression | Axes |
| Evaluate | Scale |
| Substitute | Equation |
| Order | Curve |
| Bracket | |

3a for a x 3      $\frac{a}{3}$ for a ÷ 3

ab for a x b      $a^2$ for a x a

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?**
- Use simple formulae
- Generate and describe linear number sequences
- Express missing number problems algebraically
- Find numbers that satisfy an equation with two unknowns
- Enumerate possibilities of combinations of two variables.

**How does this content link to future learning?**
- Expand, and factorise into, single brackets.
- Form and use expressions, formulae and identities.
- Forma and solve equations and inequalities with and without brackets.
- Distinguish between equations, expressions, formulae and identities.

**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.