KEVICC Key Stage 3 Curriculum Subject: Mathematics

Autumn Half-Term Proportional Reasoning

Term: Year 8 Autumn Term – Block Three | **Topic:** Multiplying and Dividing Fractions

What is the essential knowledge from this unit? 2
What do students need to remember and understand?

Students will have had a little experience of multiplying and dividing fractions in Year 6; here we seek to deepen understanding by looking at multiple representations to see what underpins the algorithms. Multiplication and division by both integers and fractions are covered, with an emphasis on the understanding of the reciprocal and its uses. Links between fractions and decimals are also revisited. Students following the Higher strand will also cover multiplying and dividing with mixed numbers and improper fractions.

National curriculum content covered:

- Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals and fractions.
- Select and use appropriate calculation strategies to solve increasingly complex problems.
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.

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 - Represent multiplication of fractions.
Lesson Two - Multiply a fraction by an integer.
Lesson Three - Find the product of a pair of unit fractions.
Lesson Four - Find the product of a pair of any fractions.
Lesson Five - Divide an integer by a fraction.
Lesson Six - Divide a fraction by a unit fraction.
Lesson Seven - Multiply and divide improper and mixed fractions.
Lesson Eight - Multiply and divide algebraic fractions.

Interleaving/Extension of previous work

- Revisit converting improper fractions and mixed numbers.
- Link to fractions of an amount.
- Multiply and divide mixed numbers.
- Multiply and divide simple algebraic fractions.

Key Vocabulary and notation.

Unit fraction	Quotient
Numerator	Divide
Denominator	Estimate
Product	Reciprocal
Repeated addition	Convert
Square	Simplify
Whole	Factors
Non-unit fraction	Generalise
Commutative	Cancel
Numerator	Term
	Expression
	Simplest Form

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?

- Represent tenths and hundredths on diagrams and number lines.
- Convert mixed numbers and improper fractions.
- Add and subtracting fractions with:
  - The same denominator
  - One denominator a multiple of the other
  - Different denominators
- Add and subtract and decimals e.g. $\frac{3}{4} + 0.2$

How does this content link to future learning?

- Revisit fraction, decimal and percentage equivalence.
- Revisit formal methods for calculation, for integers and fractions.
- Compare and use ratios in the context of fractions, decimals and percentages.
- Developing understanding of fractions, decimals and percentages.
- Evaluate percentage increase and decreases.
- Use multipliers to solve percentage problems.
- Express one number as a percentage of another.
- Finding the original given any percentage.

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.