KEVICC Key Stage 4 Curriculum Subject: Mathematics

Spring Half-Term

Term: Year 11 Spring Term – Block One | **Topic: Direct and Inverse Proportion**

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

	Specification content	Specification notes
R10	Solve problems involving direct and inverse proportion, including graphical and algebraic representations	

Students should be able to:
- use proportion to solve problems using informal strategies or the unitary method of solution
- use direct proportion to solve geometrical problems
- calculate an unknown quantity from quantities that vary in direct proportion or inverse proportion
- set up and use equations to solve word and other problems involving direct proportion or inverse proportion
- relate algebraic solutions to graphical representation of the equations
- sketch an appropriately shaped graph (partly or entirely non-linear) to represent a real-life situation
- choose the graph that is sketched correctly from a selection of alternatives
- recognise the graphs that represent direct and inverse proportion.

R13	Understand that x is inversely proportional to y is equivalent to x is proportional to $\frac{1}{y}$ interpret equations that describe direct and inverse proportion

Students should be able to:
- understand that an equation of the form y= kx represents direct proportion and that *k* is the constant of proportionality
- understand that an equation of the form $y = \frac{k}{x}$ represents inverse proportion and that *k* is the constant of proportionality.

R14	Recognise and interpret graphs that illustrate direct and inverse proportion

Students should be able to:
- interpret the meaning of the gradient as the rate of change of the variable on the vertical axis compared to the horizontal axis.

Key Vocabulary and notation.

Direct proportion	Decrease
Inverse proportion	Same
Rate of change	Reciprocal
Conversion	Curve
Ratio	Axis
Variables	x-axis
Compared	y-axis
Dividing	Table of values
Straight line	Smooth curve
Vertical	Plot
Horizontal	Product
Gradient	Vice-versa
Proportional	Constant
Increase	y= kx
	$y = \frac{k}{x}$

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?
- Recognise that equations of the form *y = mx + c* correspond to straight-line graphs in the coordinate plane
- Draw graphs of functions in which *y* is given explicitly or implicitly in terms of *x*
- Complete tables of values for straight-line graphs
- Calculate the gradient of a given straight-line given two points or from an equation
- Substitute numerical values into formulae and expressions.

How does this content link to future learning?
- Set up, solve and interpret the answers in growth and decay problems, including compound interest.
- Consolidate solving problems involving direct and inverse proportion from key stage 4.
- Consolidate recognising and interpreting graphs that illustrate direct and inverse proportion from key stage 4.
- Revise and explore subject content through examination questions and 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.

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.