KEVICC Key Stage 4 Curriculum Subject: Mathematics

Spring Half-Term

Term: Year 11 Spring Term – Block One | **Topic: Inequalities**

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

	Specification content	**Specification notes**
A22	Solve linear inequalities in one **or two** variables **and quadratic inequalities in one variable** Represent the solution set on a number line, **using set notation and on a graph**	know the conventions of an open circle on a number line for a strict inequality and a closed circle for an included boundary **in graphical work the convention of a dashed line for strict inequalities and a solid line for an included inequality will be required**

Students should be able to:
- know the difference between $<$, $\leqslant$, $\geqslant$, $>$ and $\neq$
- solve simple linear inequalities in one variable
- represent the solution set of an inequality on a number line, knowing the correct conventions of an open circle for a strict inequality and a closed circle for an included boundary.

A22h	Solve linear inequalities in one or two variables and quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph

Students should be able to:
- set up inequalities based on the information given in the question
- represent these inequalities on a given coordinate grid
- shade out the side of the boundary line that **does not** satisfy the inequality
- use the feasible region to find the optimal solution to some condition given in the question
- solve quadratic inequalities
- understand and use a solution set of discrete values written in the form $\{-2, -1, 0, 1, 2\}$
- understand and use a solution set of continuous values written in the form $-3 < x < 3$

Key Vocabulary and notation.

Variable	Optimal solution
Solve	Solve algebraically
Solution	Satisfy
Equation	Region
Expression	Dashed line
Inverse	Solid line
Balance	Test point
Inequality	Shaded
Open circle	Unshaded
Closed circle	Balance
Solution set	Is equal to
Greater/less than (or equal)	Value
Number line	Unknown
Set notation	Less/greater than
The solution set is x such that . . .	Or equal to
Union	Less than
Gradient	Greater than
Positive/Negative	Solution(s)
Linear	Balanced
y-intercept	Quadratic
Coordinate	Roots
Plot	Factorise
Set equal	Brackets
Intersect	Intercept
Solve graphically	x-axis
Discrete values	
Sketch	

$=, \neq, <, \leq, >, \geq$

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.
- Form and solve one-step and two-step equations.
- Understand equivalence of algebraic expressions.

How does this content link to future learning?
- Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions, the reciprocal function, $y = \frac{1}{x}$ with $x \neq 0$, exponential functions $y = k^x$ for positive values of k, and the trigonometrical functions (with arguments in degrees)
  - calculate values for a quadratic and draw the graph
  - draw, sketch, recognise and interpret quadratic graphs
  - draw, sketch, recognise and interpret graphs of the form $y = x^3 + k$ where k is an integer
  - draw, sketch, recognise and interpret the graph $y = \frac{1}{x}$ with $x \neq 0$
  - find an approximate value of y for a given value of x, or the approximate values of x for a given value of y.

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.