## KEVICC Key Stage 3 Curriculum Subject: Mathematics

Summer Half-Term Developing Geometry

| Term: Year 8 Summer Term - Block One | Topic: Angle in parallel lines and Polygons |
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## What is the essential knowledge from this unit?

## What do students need to remember and understand?

This builds on key stage 2 and year 7 understanding of angle notation and relationships, extending all students to explore angles in parallel lines and thus solve increasingly complex angle problems. Links are then made to the closely connected properties of polygons and quadrilaterals. The use of dynamic geometry software to illustrate results is highly recommended, and students following the Higher strand will also develop their understanding of the idea of proof. They will also start to explore constructions with rulers and pairs of compasses. This key block may take slightly longer than two weeks and the following blocks may need to be adjusted accordingly.

## National curriculum content covered:

- Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles.
- Understand and use the relationship between parallel lines and alternative and corresponding angles.
- Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons.
- Use the standard conventions for labelling the sides and angles of triangle $A B C$.

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 - Understand and use basic angle rules and notation
Lesson Two - Investigate angles between parallel lines and the transversal
Lesson Three - Identify and calculate with alternate and corresponding angles
Lesson Four - Identify and calculate with co-interior, alternate and corresponding angles
Lesson Five - Solve complex problems with parallel line angles
Lesson Six - Constructions triangles and special quadrilaterals
Lesson Seven - Investigate the properties of special quadrilaterals
Lesson Eight - Identify and calculate with sides and angles in special quadrilaterals
Lesson Nine - Understand and use the properties of diagonals of quadrilaterals
Lesson Ten - Understand and use the sum of exterior angles of any polygon
Lesson Eleven - Calculate and use the sum of the interior angles in any polygon
Lesson Twelve - Calculate missing interior angles in regular polygons
Lesson Thirteen - Prove simple geometric facts (H)
Lesson Fourteen - Construct an angle bisector (H)
Lesson Fifteen - Construct a perpendicular bisector of a line segment (H)

## Interleaving/Extension of previous work

- Revisit forming and solving equations.
- Revisit properties of shapes.
- Revisit equations of straight lines.
- Perform standard constructions including perpendiculars.
- Understand and use the properties of diagonals of quadrilaterals.

Key Vocabulary and notation.

| Adjacent | Parallelogram |
| :--- | :--- |
| Angles at a | Square |
| point | Trapezium |
| Vertically | Rectangle |
| opposite | Kite |
| Straight | Perpendicular |
| Acute | Bisect |
| Obtuse | Delta |
| Reflex | Exterior |
| Right angle | Interior |
| Parallel | Regular |
| Transversal | Polygon |
| Alternate | Sum |
| Corresponding | Total |
| Angle | Pentagon |
| Line | Hexagon |
| Supplementary | Demonstration |
| Points | Justify |
| Co-interior | Proof |
| Isosceles | Compasses |
| Equilateral | Line |
| Scalene | Line segment |
| Rhombus |  |

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?

- Classify angles
- Identify and draw parallel and perpendicular lines
- Recognise types of triangle, quadrilateral and other polygons.
- Construct triangles given SSS, SAS, ASA
- Calculate and use angles at a point, angles on a straight line and vertically opposite.
- Calculate missing angles in triangles and quadrilaterals

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.


## How does this content link to future learning?

- Review area of shapes covered in year 7.
- Calculate the area of a trapezium.
- Calculate the area of a circle, and the area of parts of a circle.
- Use significant figures.
- Calculate the area of compound shapes.

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.

