"Our curriculum is designed to help students truly master mathematics, so they can apply their skills in unfamiliar situations whenever needed. Topics from the same content areas have been grouped together to form mastery half terms. More time is spent teaching fundamentals to avoid reteaching in later years."

Spring 1: Geometry of triangles

Skills

- Derive the proof of the sum of angles in a triangle
- Find the formula for sum of the angles of any polygon
- Solve problems involving the angles/number of sides in a regular polygon
- Use the standard ruler and compass constructions for:
  - perpendicular bisector of a line segment
  - constructing a perpendicular to a given line from/at a given point
  - bisecting a given angle
- Determine when two shapes are congruent
- Give detailed reasons to justify congruence in increasingly complex situations
- Prove and use Pythagoras' theorem to find missing sides in right-angled triangles
- Solve associated problems in other shapes including right-angled triangles
- Deduce whether a triangle is right-angled by considering its sides

Knowledge

- Understand and use the sum of exterior angles of a polygon
- Understand the difference between regular and irregular shapes
- Understand and use the perpendicular distance from a point to a line as the shortest distance to the line
- Understand and use the criteria for congruent triangles
- Know the importance of Pythagoras' theorem and its uses in 2D and 3D geometry

Rationale

In this module learners will consolidate and extend their knowledge of the geometry of triangles. These units are rich with opportunities to improve visual-spatial reasoning, problem solving and reasoning skills. There are also plenty of opportunities to link to careers and realistic situations.

Learners begins by consolidating angles work from Year 7 and 8. Students will build on their knowledge to derive more angle facts including the sum of interior and exterior angles in a polygon. The emphasis here is not on learning many different facts and formula but on how these are derived and what they mean.

In the next unit, Constructions, congruence and loci, learners will explore constructions further and extend their skills using a pair of compasses and protractor. There should be an emphasis on accuracy and precise use of mathematical equipment. Within the congruence unit students will be able to extend and consolidate construction skills from the previous week. A key part of this unit is determining the relationship between the minimum conditions for congruence in and the construction of triangles.

Lastly, During this unit students will focus mainly on Pythagoras' theorem, including some proofs and demonstrations. The theorem is derived using an investigation involving the area of squares; this can then be used to introduce a geometrical demonstration of why Pythagoras' Theorem is true for right-angled triangles.