"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: Proportional reasoning

Skills

- Use ratio notation to describe a multiplicative relationship (revise from year 7)
- Solve problems involving ratios (revise from year 7)
- Calculate with speed, distance and time
- Calculate with other compound measures such as density
- Check an equation to ensure the units are consistent on both sides
- Solve proportion problems, involving direct and indirect proportion
- Represent proportional relationships using tables and graphs
- Represent proportional relationships algebraically

Knowledge

- Explore ratios in different contexts including speed and other rates of change
- Contrast ratio relationships involving discrete and continuous measures
- Use speed and other rates of change to draw and interpret graphical representations
- Explore density and concentration as other contexts for proportional relationships
- Explore contexts involving proportional relationships
- Understanding about graphs of proportional relationships
- Meaning and properties of inverse proportional relationships
- Investigate constant area as a context for indirect proportion
- Represent inverse proportion relationships algebraically

Rationale

This module builds on the proportional reasoning taught in year 7 and allows students to experience the different ways of defining ratio and proportion. Throughout year 7, learners' proportional reasoning was developed through experiences in multiplication, division, fractions, decimals and percentages, as well as a unit introducing ratio.

Time is spent in unit 6 reinforcing the notion of a ratio as an expression of a constant multiplicative relationship which can be between quantities in the same unit e.g. fractions or between two quantities in different units e.g. speed measured in miles per hour. A variety of contexts are used to explore and clarify concepts. Having established ratio as an expression of a relationship between two quantities, this is applied to ratio problems where students are required to divide an amount into a given ratio and find different quantities given a ratio.

Next, learners examine proportional relationships in familiar contexts before looking at the meaning of direct proportion in abstract. Students are encouraged to compare different approaches to solving problems involving direct proportion. In the second week of this unit, learners will meet the concept of inverse proportion. Learners will encounter this in different contexts, notably by studying perimeter for a constant area.