PAINT WITH NUMBERS: Sequence Overview

Summary of learning goals

This sequence explores ratios through the context of mixing paint. Students recognise that ratios express a multiplicative relationship between two measures and that the numerical values of both quantities need to change by the same factor for the proportion to remain constant (**covariation**).

Australian Curriculum: Mathematics (Year 7)

ACMNA173: Recognise and solve problems involving simple ratios.

Summary of lessons

Who is this Sequence for?

The sequence has been designed for students in Year 7 who have a knowledge of multiplication.

Lesson 1: Mixing Paint

Students mix two batches of pink paint, one batch mixing red and white paint in the ratio 1:2 and the other batch in the ratio 1:5. They explore how to keep the ratio constant when increasing the quantity of red or white paint.

Lesson 2: Adding Parts

Students are posed with the scenario of painting a wall using a mixture of blue and white paint in the ratio of 1:3. They determine if adding an extra tin of each colour changes the ratio.

Lesson 3: Mixing Ratios

This task presents the context of combining two equal sized tins containing different shades of green paint. One tin contains a mixture of green and white paint in the ratio of 1:3, the second tin a mixture in the ratio of 1:7. Students determine the resulting ratio of green to white paint when the two tins are combined.

We value your feedback after these lessons via our website.

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Reflection on this sequence

Rationale

A ratio expresses a multiplicative relationship between two quantities or measures. Students' initial experiences with measures require reasoning with a single quantity. Ratios require students to coordinate two quantities simultaneously. This sequence deals with ratios as a composed unit. A composed unit is the coordination of two quantities to form one, new unit (Lamon, 1994). New, equivalent units or ratios are formed by *partitioning* and *iterating* the original composed unit. Initially, students use intuitive partitioning and iterating strategies such as doubling and halving. More sophisticated skills are built over time through a variety of different problems.

reSolve Mathematics is Purposeful

- Students explore proportional and non-proportional measures through the real-world context of mixing paint.

reSolve Tasks are Inclusive and Challenging

- Students physically mix paint and represent situations using blocks to explore proportion.
- Tasks in the sequence have a low floor and high ceiling allowing access and challenge for all.

reSolve Classrooms Have a Knowledge Building Culture

- Class explorations and discussions are central to building an understanding of ratios as a multiplicative relationship between two measures.

Acknowledgements

Task 3 is based on the NRICH task Mixing Paint.