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Pink paint

Changing the amount of one colour in a mixture of paints is a good way to explore how proportions work, says Colin Foster

Proportionality is one of the hardest and most important ideas in lower secondary mathematics. Students need to encounter different examples of situations in which proportions feature, and to gain experience at representing proportions visually in different ways. In this lesson, students work on a task about pink paint, which is made from a mixture of red paint and white paint. How much red paint do you need to add to pink paint which is 60% red to turn it into pink paint which is 80% red? The answer may be more than you expect! Students work on several problems relating to a situation of 'sunk costs', where paint has been mixed in the wrong proportions and has to be corrected. They will make up their own problems for each other to solve and experiment with using different ways to represent the makeup of the different mixtures of pink paint. This lesson provides lots of opportunities to explore how proportions work and gain a better sense of what something like '60% pink' really means. Generalisations are possible, and the lesson ends with students describing what they have found out, what problems they have created for each other, and what they have learned from all of this about proportionality.



ABOUT THE AUTHOR

Colin Foster is an assistant professor in mathematics education in the School of Education at the University of Nottingham. He has written many books and articles for mathematics teachers, including his latest, *Questions Pupils Ask* – available at members.m-a.org.uk/Shop/product/1114 (www.foster77.co.uk).

WHY TEACH THIS?

- + Ratio and proportion is an important area of school mathematics, but one that students often find particularly difficult
- + Being able to think proportionally enables students to make sense of lots of different real-life situations
- + The real-life scenario of mixing two different colours of paint gives students a concrete way to understand the mathematical idea of proportion
- + Working out how to fix some paint mixing that has gone wrong can be fun and engaging for students

SNEAK

PEEK

Shifa makes pink paint by mixing red paint and white paint. She makes 5 litres of 60% pink paint (this means that 60% of the mixture is red paint and the other 40% is white paint). Then suddenly she realises that she meant to make 5 litres of 80% pink paint instead! Oh dear! What can she do to fix it? She wants to use the smallest possible amount of extra paint to fix her mistake. How should she do it?



+KEY RESOURCE

Preparing for GCSE Problem Solving

Many students still struggle to acquire the skills for solving problems in mathematics. This new book from the ATM (with accompanying whiteboard slides) shows you how, as a teacher, you can use the tasks in the book to develop those skills in your classroom. Prompts and guidance are included for each task, and advice on when and how to use each task. There is a section at the end on applying these skills directly to exam questions. Students introduced to the strategies in this book have successfully gone on to use them in their exams. www.atm.org.uk/shop/act104pk

