

# Challenging topics at GCSE

## Ratio and Proportion

NCP18-15



### Overview

In many respects, the GCSE, first taught in autumn 2015 and examined in summer 2017, still feels new, and throws up new challenges for teachers and pupils alike. In 2017-2018 there was a Maths Hubs pilot project which explored ways of teaching those GCSE maths topics teachers found challenging to teach, and students found challenging to learn. In 2020-2021, this work will continue. Work Groups will explore effective ways of teaching some of these topics, both to address the immediate needs of the incoming KS4 pupils, but also, crucially, taking a longer-term view by considering development in KS3. The aim will be to get to grips with all the underpinning content of a topic, exploring misconceptions and effective pedagogical approaches for each element.

### Dates

#### **Session 1 – 20<sup>th</sup> January 2:00pm-3:30pm** **(Zoom)**

- What makes a topic challenging?
- Exam questions
- Challenges

#### **Session 2 – 23<sup>rd</sup> February 2:00pm-3:30pm** **(Zoom)**

- Reflection on gap task
- Unpicking a topic
- Common issues and misconceptions
- Activities and explanations

#### **Session 3 – 19<sup>th</sup> April 9:30am-12:00pm** **(St Patrick's RC High School)**

- Reflection on the gap task
- Reflecting on leading CPD
- Diagnostic questions
- Changes to be made
- Next steps

#### **Session 4 – 17<sup>th</sup> June 1:00pm-3:30pm** **(St Patrick's RC High School)**

- Feedback
- Common approaches
- Reflections
- Evaluations

### Who is this for?

Secondary school Maths teachers and heads of department. Schools are invited to send more than one participant for the project.

### What is involved?

We will explore the GCSE topic of Ratio and Proportion in great depth, establishing what the issues are and what the common misconceptions are, how these might be addressed through activities and questioning which promote deeper thinking and how teaching in KS3 might be modified or utilised to improve understanding for this topic in KS4.

## Intended Outcomes

- Teachers will hone their ability to analyse what it is about certain topics that makes them more challenging and be able to apply these analytical skills more widely in the curriculum.
- Through detailed study of one topic, teachers will develop a sharper understanding of what it means for teaching to be 'effective' and how this might be evaluated in class and through assessment in all its forms.
- Pupils in the participant teachers' classes will become more confident in their own skills and abilities, developing a deeper and more connected understanding of prior content thus enabling them to better tackle the challenging topics.

### Expectations of participants and their schools

- Attend the Work Group sessions and carry out a series of follow up tasks within their own classrooms related to teaching the challenging topic being explored.
- Work with other members of their mathematics department, as appropriate to develop the teaching of the challenging topic.

### The wider context

Collectively, the network of Maths Hubs across England work on projects around national maths education priority areas. One of those priorities includes the phrase 'supporting schools and colleges to address the immediate challenge of teaching the 9-1 GCSE.' Each Maths Hub participating in a national project runs a local Work Group, where teachers come together over a period of time to work on areas defined by the project. All Work Groups are subject to a common evaluation process, which collectively provides a body of evidence on the project's outcomes. So, your participation in this Work Group will contribute to your own professional learning, and that of your school colleagues, as well as making a contribution to the improvement of maths education at a national level. This Work Group extends work started in all Maths Hubs in autumn 2016.