

Effectiveness Trial of the Mathematical Reasoning Programme 2024-2025

School Information Sheet

About the Mathematical Reasoning Programme

Mathematical Reasoning (MR) is a 12 to 15-week programme developed by the University of Oxford for pupils in Year 2. The programme aims to improve mathematical attainment by developing pupils' understanding of the logical principles underlying mathematics, primarily:

- Quantitative Reasoning - the ability to reason about quantities and relations between quantities with or without numbers; and
- Arithmetic - the ability to reason about relations between numbers using the four operations, with a specific focus on additive composition and the inverse relation between addition and subtraction.

What does the Mathematical Reasoning programme involve?

The MR programme consists of twelve teaching units, designed to last approximately 12 to 15 weeks, with children receiving approximately one hour of MR content per week as part of their normal mathematics lessons. The programme is fully resourced and includes online games for pupils to use.

The teacher and TA for each participating Year 2 class are supported to deliver the programme through an online training course and support provided by the University of Oxford. The training course includes:

- i. Six core modules designed to:
 - Develop teachers' and TAs' understanding of why mathematical reasoning is important and what quantitative reasoning, arithmetic and number sense involve.
 - Provide practical guidance on programme delivery.
 - Support teachers and TAs to maintain gains and to expand the teaching of mathematical reasoning after the programme ends.
- ii. Three *optional* modules for how mathematical reasoning can be taught to other age groups. These modules cover teaching fractions, using diagrams to reason about problems, and reasoning about different types of quantities.

The training course is fully online so can be completed at a time convenient for teachers and TAs. The core modules take approximately 2 days to complete, and the first five modules need to be completed in November 2024. This is so teachers and TAs can begin delivering the Mathematical Reasoning programme to Year 2 pupils in place of one of their regular maths lessons each week either before or immediately after the Christmas break. Teachers and TAs will also have access to three live interactive webinars with a Teacher Leader (TL) over the course of the trial (total time 1 day), as well as personalised support from a TL via an online forum. Schools will retain access to the training and to the programme throughout the school year 2024-25.

About the Effectiveness Trial

The Education Endowment Foundation (EEF) is funding the National Foundation for Educational Research (NFER) to evaluate the MR programme, which is delivered by the Year 2 teachers with support from the University of Oxford. The evaluation aims to:

- Determine the impact of the MR programme on the mathematical attainment of Year 2 children using GL Assessment's Progress Test in Maths (PTM).
- Explore how best to implement the programme on a larger scale in future by finding out how well the online training worked at scale.

The evaluation will run as a Randomised Controlled Trial (RCT) in the 2024-25 academic year. NFER will randomly allocate 240 eligible schools to one of the two following groups:

- 1) The intervention group, which will deliver the MR programme; or
- 2) The comparison group, which will continue with usual practice.

All pupils in participating classes will be assessed by their teacher using GL Assessment's Progress Test in Maths (PTM-6) in autumn 2024 (before randomisation). Once programme delivery is complete, an NFER Test Administrator will assess the children using PTM-7 in the summer of 2025.

Teachers and TAs in all participating schools will be asked to complete brief surveys at the start and end of the delivery period. We will extract pseudonymised data about the pupils' performance in the online games from the programme website.

Teacher responses to the questions on the on-line training course will be collected, anonymised, and shared with the evaluation team.

A small number of schools will also be invited to participate in additional data collection activities, including staff interviews, session delivery observations and focus groups.

Who can take part in this trial?

To be eligible to take part in the current evaluation, schools **must**:

- Be state primary schools in England;
- **Not** be participating in the Maths-Whizz or Maths Mastery EEF trials;
- Should they be randomly allocated to the intervention group:
 - a. Be willing to release the teacher and TA for each participating class for 2 days to complete the training and a total of 1 day to attend the online webinars;
 - b. Be able to provide each participating class with the screen required for the teacher to use PowerPoint slides for the whole-class component and individual devices with an internet connection for pupils to use when working on the computer games component of the programme;
- Agree to facilitate the evaluation data collection activities outlined in these documents.

Schools can choose to run the programme in one or more Year 2 classes. Mixed-year group

classes are eligible, but only Year 2 pupils will be assessed as part of the evaluation.

Ethical approvals

This study has been approved by the University of Oxford's and NFER's ethical committees. There are robust safeguarding procedures in place to protect children during all stages of this evaluation.

What are the benefits or risks of my school participating in this trial?

We do not anticipate any risks or harm to the schools, staff or pupils participating in this study.

All participating schools will receive pupils' individual endpoint assessment scores. In addition, your school will be contributing to the evidence base about impact of the MR programme on Year 2 mathematical attainment and helping us learn more about the programme's implementation.

Schools allocated to the intervention group will receive all the training and resources for delivery of the MR programme free of charge. Once all the data collection has been completed, schools allocated to the comparison group will receive £500 as an acknowledgement for their participation in this study. These funds can be used at the discretion of your school.

What is the timeline for my school's involvement?

Time	Event
Feb - July 2024	<ul style="list-style-type: none"> Schools sign a Memorandum of Understanding (MoU) agreeing the details of the project. NFER contacts schools who have signed the MoU and provides the parent information letter and withdrawal form. Schools provide NFER with pupil data (name, date of birth, UPN, FSM, gender, class name) using NFER's secure portal.
September 2024	<ul style="list-style-type: none"> All schools administer the PTM6 assessment to all pupils in Y2 participating in the evaluation (using booklets supplied by NFER and in accordance with assessment guidance) and return the booklets to NFER using a secure courier. Schools will not incur any expenses as part of the assessment process. Schools inform NFER of any pupils who have left the schools since pupil data was collected by completing the assessment attendance register. All participating teachers complete a brief online survey containing questions about their usual practice in maths teaching and their views about mathematical reasoning. Schools will be informed of dates and times of online training events and be asked to make arrangements to participate in the training, if they are randomly assigned to the intervention group.
October 2024	<ul style="list-style-type: none"> All schools are notified of their group allocation (intervention or comparison).

November 2024	Intervention schools: <ul style="list-style-type: none"> Online launch event for the programme. Head Teachers and Maths Leads are encouraged to participate alongside the teachers and TAs. Teachers and TAs complete the online training. Comparison schools: <ul style="list-style-type: none"> Continue with usual practice.
December 2024 – April 2025	Intervention schools: <ul style="list-style-type: none"> Deliver the MR programme and complete the session delivery log. Teachers and TAs attend three live training webinars. A small number of schools (optional) participate in staff interviews, session delivery observations and pupil focus groups. Comparison schools <ul style="list-style-type: none"> Continue with usual practice.
June 2025	All schools: <ul style="list-style-type: none"> Facilitate visit/s from an NFER test administrator to administer the PTM7 to all participating Year 2 children. Intervention schools: <ul style="list-style-type: none"> Year 2 teachers and TAs complete a brief online survey focused on their experiences of using the intervention, perceived outcomes, and their views about mathematical reasoning. Comparison schools: <ul style="list-style-type: none"> Year 2 teachers complete an online survey focused on their usual practice and their views about mathematical reasoning.
July 2025	<ul style="list-style-type: none"> Oxford University liaises with comparison schools about payment.
September 2025	<ul style="list-style-type: none"> All schools receive pupils' individual endpoint assessment scores.
March 2026	<ul style="list-style-type: none"> Publication of the final report.

Use of Data

NFER is the data controller for the evaluation so will decide what personal data is used and how, following the study objectives set by the EEF, the Data Protection Act 2018 and General Data Protection Regulation (GDPR), and will treat all data with the strictest confidence.

NFER's school and parent/carer [privacy notices](#) set out the legal basis for processing personal data and the ways NFER will use personal data for the purposes of this evaluation. Please ensure that you review these before signing the Memorandum of Understanding (MOU).

No school, staff member or pupil will be named in any report arising from this work, nor will we include any information that might mean that someone else could identify them.

NFER will delete any personal data collected within one year of the final report being published. This deletion process is currently planned for March 2027. Interview recordings will be deleted as soon as the interview notes/transcriptions have been finalised.

The University of Oxford is the data controller for the programme delivery. You can find their privacy notice [here](#).

Who should I contact if I have questions?

For further information about the MR programme, please get in touch with the Research Project Manager, Louise Matthews at reasoningfirst@education.ox.ac.uk

For further information about the evaluation, please get in touch with the NFER evaluation team at MR-Y2@nfer.ac.uk.