Numeracy catch-up programme

Mathematics Recovery

<table>
<thead>
<tr>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target audience</strong></td>
</tr>
<tr>
<td><strong>Evidence of impact</strong></td>
</tr>
<tr>
<td><strong>Method of delivery</strong></td>
</tr>
<tr>
<td><strong>Practitioner support</strong></td>
</tr>
</tbody>
</table>

**Overview of intervention**

The Mathematics Recovery Programme was developed in Australia during the early 1990s. It was originally devised as an intensive, one-to-one programme for low-attaining learners. However, while maintaining its individualised focus, the programme has evolved over time and has also been used as a group-based and whole-class initiative for addressing numeracy gaps at a range of ages and ability levels\(^4\).

The emphasis of the Mathematics Recovery Programme is upon ongoing assessment and observation, to determine learners’ knowledge and to identify the strategies they use to tackle mathematical challenges, in order to support the development of their knowledge, ability and self-confidence in numeracy. The programme also involves teacher reflection through the use of videotape for both the assessment interviews and during the teaching sessions.

---

\(^1\) In schools in England.
\(^2\) Standardised scores provide a means of understanding test scores more objectively than by using straight percentages. They take into account factors such as how difficult the test was, or how an individual learner’s scores compare with the scores of another learner, or against wider benchmark data.
\(^3\) In the curriculum in England, Key Stages 1, 2, and 3 are accompanied by a series of eight levels that are used to measure learners’ progress compared to learners of the same age across the country.
\(^4\) Please note that the purpose of this document is to provide guidance on delivering Mathematics Recovery as a catch-up intervention, on either in one-to-one or group-based sessions and is not intended as guidance on a whole-school or whole-class approach.
The intervention materials and training are not currently available in Welsh but training to deliver the intervention in English is available to practitioners in Wales.

Target audience

The intervention is appropriate for learners in Year 1 and above who are ‘struggling’ with their mathematics. It is typically delivered to learners of six and seven years old, although it can also been used with learners in other age groups; despite the emphasis on early intervention for young learners, assessment and teaching materials and activities can be and are used for learners up to 12 years old.

There are no hard and fast criteria for selection for or exit from the programme.

Impact evidence base

Mathematics Recovery was one of the interventions trialled for seven-year-olds\(^5\) with numeracy difficulties in the research carried out during the summer term of 2008 by the Every Child Counts (ECC) initiative\(^6\).

The intervention was studied in 20 schools across two local authorities, with a total of 88 Year 2 learners, each starting at an average national curriculum level of just over Level 1C\(^7\).

Results were assessed in terms of gains in national curriculum points\(^8\) and in terms of gains in scores on the NFER standardised mathematics test. The table below sets out the results for each of the two local authorities.

<table>
<thead>
<tr>
<th>Local authority</th>
<th>Number of learners in cohort</th>
<th>Average number of Mathematics Recovery lessons</th>
<th>Mean gain in national curriculum sublevels</th>
<th>Mean gain in NFER standard score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>41</td>
<td>44</td>
<td>3.13</td>
<td>19.26</td>
</tr>
<tr>
<td>E</td>
<td>47</td>
<td>16</td>
<td>1.95</td>
<td>10.84</td>
</tr>
</tbody>
</table>

---

\(^5\) In schools in England.

\(^6\) Every Child Counts (ECC) is an early numeracy strategy for raising achievement in mathematics in primary schools in England via three levels of support.

\(^7\) What Works for Children with Mathematical Difficulties? The effectiveness of intervention schemes, A Dowker (University of Oxford, 2009).

\(^8\) ‘0’ represented ‘Working toward Level 1’ and ‘7’ represented ‘Level 3C’.
By the end of Year 2, 83 per cent of the learners in local authority A had reached at least Level 2C, and 41 per cent had reached at least Level 2B.

In local authority E, 53 per cent of the learners reached at least Level 2C and 32 per cent reached at least Level 2B.

There is no official data based on a comparison group who did not receive support at all or who received support of an alternative nature.

Method of delivery

Instruction within Mathematics Recovery sessions is guided by initial comprehensive assessment (see section below on ‘Assessment procedure’) and ongoing observational assessment and the key topics that are selected are tailored to the learner's overall stage. The sessions focus on developing skills and knowledge in: number words and number word sequences; recognition, identification and writing numerals; strategies for adding and subtracting; the tens and ones aspect of the numeration system; and methods of notation in arithmetic.

An Instructional Framework in Early Number that is bespoke to the Mathematics Recovery Programme informs the teaching content of the sessions, in which the learner solves mathematical problems which are just beyond his or her current knowledge.

Assessment procedure

A Learning Framework in Number (also developed for the Mathematics Recovery Programme) provides the necessary structures for assessment and an individual profile based on assessment is used to develop a personalised teaching framework for each learner.

At the start of the Mathematics Recovery Programme a diagnostic assessment interview is carried out with the learner to ascertain their current level of ability. The assessment (that has been developed specifically for the Mathematics Recovery Programme) is neither age-related nor curriculum-based and involves no reading or writing. Instead, it consists of six video-taped assessment interviews with the individual learner focussing entirely on number knowledge and structure and upon determining strategies that the learner uses to solve mathematical tasks.
Six interview-based assessments schedules of the Mathematics Recovery Programme

Assessment 1.1 and 1.2 address the relative sophistication of the learner’s strategies for adding and subtracting; facility with number words and number word sequences both forward and backward; ability to identify, recognise and sequence numerals.

Assessment 2.1 and 2.2 addresses the learner’s knowledge of the tens and ones structure of the numeration system; relative sophistication and range of strategies other than counting-by-ones to solve addition and subtraction tasks.

Assessment 3.1 and 3.2 addresses early multiplication and division and other areas.

The National Numeracy Tests for learners in Years 2 to 9, to be introduced in Wales in May 2013, will support this process of initial assessment.

Timescale for delivery of intervention

As a one-to-one or small group session the Mathematics Recovery Programme involves 30-minute sessions delivered four or five days a week over a period of between 10 and 15 weeks.

Cost and resource requirements

Training to deliver Mathematics Recovery is available from the Mathematics Recovery Council UK and Ireland. Training for each module costs £175 per delegate per day including venue and refreshments, and can be delivered to a minimum of 15 delegates.

Additional resource is needed to fund the teaching assistant or teacher’s time for delivery.

Practitioner training

The Mathematics Recovery Intervention Professional Development is intended for teachers and experienced teaching assistants.

---

9 The Mathematics Recovery Council UK and Ireland which is a not-for-profit organisation that aims to support those in education wishing to use the Mathematics Recovery Programme.

10 For practitioners who attend Module 1 and Module 2, this involves eight days, at a total cost of £1,400 per person.

11 If local authorities or schools provide a venue costs are considerably lower.
The training programme enables teachers to become specialists in learners’ early mathematical development and equips them to provide support to colleagues in the school on numeracy development. Every teaching assistant must be supported by a teacher. Teachers may support more than one teaching assistant. There are two modules available to practitioners:

- Module 1 (five days) enables teachers and teaching assistants to provide intervention for learners within Key Stage 1
- Module 2 (three days) builds on and extends Module 1 and enables teachers and teaching assistants to provide intervention at both Key Stages 1 and 2.

**Structure of Mathematics Recovery training**

Module 1 (five training days):
- Days 1 and 2: Assessment focus
  - gap tasks to complete in school
- Days 3, 4 and 5: Teaching focus
  - intervention begins.

Fee includes:
- five days face-to-face training for teachers and teaching assistants
- assessment pack and two course books
- continuing support through a Mathematics Recovery consultant.

Module 2 (three training days):
- Days 6, 7 and 8: Assessment and teaching focus on:
  - tens and ones, structuring number to 20
  - multiplication and division
  - intervention continues.

Fee includes:
- five days face-to-face training for teachers and teaching assistants
- assessment pack and one course book
- continuing support through a Mathematics Recovery consultant
- optional accreditation, upon completion of a portfolio, by the Mathematics Recovery Council UK and Ireland.
Additional teaching resources and practitioner support

A range of useful resources, including the four books in the Mathematics Recovery series, are available from various suppliers and can be viewed on the resources page of the Mathematics Recovery Council UK and Ireland website at www.mathsrecovery.org.uk/resources

Further information

Further information is available at www.mathsrecovery.org.uk