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Enhancing Mathematical Learning through Talk

Introduction to Mathematics Monitoring Tasks for Key Stage One

Tracking Progress against the NC Programme of Study

THE BRIGHTER BOROUGH Wandsworth

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Merton Education Partnership
The Education Network

Monitoring Progress in Mathematics at Key Stage 1

The purpose of this monitoring tool is to support teachers in tracking the progress of Year 1 and Year 2 pupils against **selected content** of the KS1 National Curriculum (DfE 2013) mathematics programmes of study. As well as providing opportunities for pupils to use and apply their mathematical knowledge and skills to **solve problems**, the monitoring tasks also address pupils' ability to **reason mathematically**. **The tasks should be used to establish a baseline in the third and fourth weeks of September. An equivalent set of tasks will be used again in June to identify progress. The tasks have been set against end of year expectations for each year group**.

There are six tasksin the Mathematics Monitoring Task booklets for Year 1 children and six tasks for Year 2 children which can be mapped against the strands of the National Curriculum mathematics programme of study (Appendix 1). Greater emphasis has been given to monitoring pupils' developing confidence and mental fluency with whole numbers, place value (counting), addition and subtraction. The six tasks are sub-divided into between 3 and 6 questions. In order to keep these tasks as manageable as possible, some elements of the curriculum are not covered by the tasks, most notably, elements of the measurement strand of the programme of study. Hence, this monitoring tool is not designed to replace but to complement all other forms of monitoring pupil progress in mathematics that schools will already have in place and will provide teachers with diagnostics insights into individual children's mathematical understanding.

How to use this monitoring tool

Grouping the children

The six monitoring tasks are designed for a teacher to work with a small group of children at a time. Trialling of the Year 1 tasks was undertaken with groups of six children but we strongly recommend that you work with a group of **four** children at a time.

If possible, find a separate space outside of the classroom to sit comfortably with the group and position the children in such a way that they can't easily see each other's whiteboards or resources. You can decide whether to have mixed or 'same' ability groups for the monitoring tasks but keeping to the familiar groupings for your class may be the best approach. As far as possible, children with special educational needs should be included in the monitoring process and you should use your own professional judgement as to whether one or two individual children may need slightly adapted resources in order to access the task questions.

Gathering resources

A reference list of all of the necessary resources for you to collect together before you begin the tasks can be found at the beginning of each task booklet, and again within each task description. Most of the resources have been provided for you **although some photocopying will also be needed as well as some classroom resources, for example, mini whiteboards and multilink (or equivalent) and place value equipment**.

Preliminary discussion with the children

At the outset, it is important that the children realise that you will be working with them in a different way to usual as you would like to make some notes on their thinking and what they know about some of the things that they have been doing in their maths lessons such as counting, adding and subtracting. Explain that you have some questions to ask them. Show them the task booklet and explain that the questions that you will ask them are written down in the booklet and that you will write your notes in the booklet as well – you may like to show them a Marking Grid with their names on.

Explain that when you ask them a question, you would like them to think about the answer in their heads and not shout the answers out. Also explain that sometimes they will show you their answers (or thinking) in different ways – sometimes on their whiteboard or you may sometimes ask them to tell you their answers but you will let them know how to share their answer each time. **Reassure the children that they should do their best and not worry if they can't do something as you will work with them another time (not today) to help them to work it out**. None of the tasks should be detrimental to pupils' confidence or self-esteem. Re-iterate that you are interested in *their thinking* as it will help you to plan more lessons for them.

The first time that you work through the tasks with a group it will take you longer than with subsequent groups. You can repeat each question twice and, if necessary, a third time for clarification. Adopt as neutral a tone as possible. For ease of reference, the format for each task is the same and each task begins on a new page and includes:

- ✓ The number and title of the task
- ✓ A list of resources needed
- ✓ The NC reference(s) NB aspects from the NC requirement not covered in the task is enclosed in [square brackets]
- ✓ Instructions for the Teacher (left hand column) with a suggested 'script' for introducing the task and sub-tasks to the children.
- ✓ The particular Monitoring Focus (middle column)
- ✓ A subdivided Marking Grid to record the individual responses of four children at a time; the total scores for each child on the task, and a row to record their ability to provide reasons using the 'reasoning scale' described below. It is advisable to use pencil to record the children's responses.
- ✓ A separate grid is provided for you to record any notes that you would like to record about children's thinking or reasoning for each task.

There is a separate whole class summary proforma for you to complete and send to the Brunel University Project Team. All data will be anonymised and remain confidential to the Project Team.

Monitoring reasoning

The monitoring tasks provide opportunities for Yr 1 and Yr 2 children to demonstrate their knowledge and understanding of number and also how well they are beginning to develop the ability to reason or think mathematically. Reasoning is evidenced in a number of ways. For example, a Year 1 child may explain how they know what the next number in the sequence is ("I count on two more") or how they identify a half ("each half is the same length") whereas a Year 2 child may reason by applying a known number bond to a more complex problem (" I know 16 + 4 is 20, so I know 20 – 4 is 16). In every task there is an opportunity to give points for reasoning by using the following scale:

0 – Incorrect answers

1 – Some correct answers with no reasoning

2 – Some correct answers with some attempt at reasoning

3 – All correct answers with some attempt at reasoning

4 – All correct answers with clear reasoning

There is space on the separate class summary proforma for you to record an average point score for reasoning.

APPENDIX 1: Monitoring tasks mapped against the National Curriculum KS1 mathematics programme of study.

Year 1 Monitoring tasks mapped against elements from the Yr 1 National Curriculum programme of study

No.	Monitoring Task	National Curriculum Programme of Study [ ] indicates that this aspect is not covered in the task
1	Counting	**Number – number and place value** • count to [and across] 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, [read] and write numbers to 100 in numerals • given a number, identify one more and one less
2a + 2b	Calculating including missing number problems	**Number – addition and subtraction** • read, [write] and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs • [represent and] use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20 [including 0] • solve one-step problems that involve addition and subtraction [using concrete objects and pictorial representation] and missing number problems such as 7 = □ – 9
3	Creating number sentences	**Number – addition and subtraction** • [represent and] use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20 including zero
4	Counting in 2s, 5s and 10s	**Number – number and place value** • count in multiples of twos, fives and tens
5	Fractions	**Number – fractions** • recognise, find [and name] a half as one of two equal parts of an object, shape or [quantity] • recognise, find [and name] a quarter as one of four equal parts of an [object] shape or [quantity]
6	Money	**Measurement** • recognise and know the value of different denominations of coins [and notes] **Number – addition and subtraction** • solve one-step problems that involve addition [and subtraction]

Year 2 Monitoring tasks mapped against elements from the Yr 1 National Curriculum programme of study

No.	Monitoring Task	National Curriculum Programme of Study [ ] indicates that this aspect is not covered in the task
1	Number – number place and value	**Number – number and place value** • compare and order numbers from 0 up to 100; use <, > and = signs • [identify,] represent [and estimate] numbers using different representations, [including the number line] • read and write numbers to at least 100 in numerals [and in words] • recognise the place value of each digit in a two-digit number (tens, ones)
2a + 2b	Number – addition and subtraction including missing number problems	**Number – addition and subtraction** • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ■ a two-digit number and ones ■ a two-digit number and tens ■ two two-digit numbers ■ adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. • solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, [quantities and measures] • applying their increasing knowledge of mental and written methods
3	Number – multiplication and division	**Number – multiplication and division** • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, [including recognising odd and even numbers] • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
4	Counting in 2s, 3s , 5s and 10s	**Number – number and place value** • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward
5	Fractions	**Number – fractions** • recognise, find, [name and write] fractions 1/3, 1/4, 2/4 and 3/4 of a [length,] shape, set of objects or quantity
6	Money	**Measurement** • recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

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