

Fast Maths!

Teacher's Manual: Reciprocal Peer Tutoring

by

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Getting ready:

Whole class or SEN?

At first, many schools will prefer to use ***Fast Maths*** in a conventional one-on-one tutoring format. It's a lot simpler-- but if your resources permit, this is why you should consider using ***Fast Maths*** with all pupils in a year group:

- *Motivating SEN pupils*—they will get the message that they can master the same material as other children. On the **Progress Tests**, they will make the biggest gains.
- *Motivating all pupils*—the calculating strategies all pupils learn may give them ‘number sense’, but they need to progress to **automatic recall** of number bonds. This will free their working memories for more challenging and interesting tasks.
- *Number bonds for addition*—we have found that many children who know their multiplication tables reasonably well still have to count on their fingers when adding single digit numbers.

Stopwatches:

It's not easy getting pupils to switch from counting or calculating to **automatic recall**—old habits die hard! Pupils hate getting the wrong answer, so they prefer to stick with what they know. That's why stopwatches are at the heart of ***Fast Maths***.

Since all of your pupils will be working in pairs, you will need at least one stopwatch for every two pupils. It's even better if they each have their own. We have used the *Accessotech Digital Handheld Sports Stopwatch Stop Watch Time Clock Alarm Counter Timer*, which is user-friendly. So far they have proved reliable and robust, and they are available for £2.99 each from Amazon.

Reciprocal Peer Tutoring (RPT):

RPT is simplicity itself—pupils work in pairs closely matched for ability. They check each other's workbook exercises, and use the flashcards with each other.

- Studies have shown that RPT improves academic performance and behaviour of low-ability pupils, especially when used with structured programmes such as ***Fast Maths***.
- RPT motivates pupils because they are always working at the right level—hence, it is **self-differentiating**.
- **Peer assessment** greatly reduces the need for teacher assessment.
- Pupils record times in their workbooks, providing **proof of progress**.

Placement test for addition:

The placement test for addition is on p 4 of the Workbook.

- Before you start, be sure your pupils know that it is a timed test, and they must not begin until you tell them.
- The easiest way to record pupils' times is to tell them to raise their hand when they are finished, and you can record their times. This is easy if you have a stopwatch running on your desk.
- If any pupils are still writing after 7 minutes, tell them to stop. These pupils will almost certainly need a lot of work with the **flashcards**. However, they will also be the ones to make the most spectacular gains!
- The Placement Test will also be used later as a Progress Test on pp 23 and 41. Pupils will invariably be amazed at how quickly they have improved!

Lastly--assign pupils to work in pairs. Partners should have similar times--you want them to progress at approximately the same rate. That way, they will get additional practice showing the flashcards to their partner, and correcting their workbooks.

Getting Started—Day 1

Flashcards:

Allow about 30 minutes for the first three lessons—after this, 10-15 minutes per session. Little and often is the best way to teach basic skills.

First, have your pupils cut up the addition flashcards carefully (keep the multiplication flashcards in a safe place until they are needed). Tell them to take the 1+ and 2+ flashcards and put them in the CD pocket inside the front cover, and the rest in the pocket in the back cover.

Next, you will have to do a demonstration with one of your slower pupils—but one who likes to show off a bit. ***The following procedure is critical:***

1. Take the cards out of the front pocket and shuffle them—tell your pupils they must shuffle the cards every time they use them.
2. Hold up the top card. If the pupil gives the right answer, ‘give’ it to them—lay it down on the table in front of them.
3. If your pupil doesn’t come up with the right answer in **one second**, just tell them the answer and ask them to repeat it.
4. Bury the card one or two back in the pack that’s still in your hand. The next time it comes up, the pupil will get it right.

Rather than struggling to recall the answer—or in this case, merely counting on fingers or toes—the pupil gets the right answer painlessly and goes out on a high note. This takes the stress out of rote learning and builds confidence. When the same card comes up in the next session, the odds are very high that the pupil will get it right the first time.

Once the pupil has ‘won’ all the cards, you swap roles: your pupil teaches ***you***. That’s what **Reciprocal Peer Tutoring** is all about.

Getting Started—Day 2

Flashcard practice:

Getting the flashcard exercise right is absolutely critical—the response must be instant and automatic. If pupils have enough time to count or calculate the answer, they aren't learning anything.

For Day 2, your only objective is to make sure all of your pupils are getting the flashcard exercise right. Discuss the 4 steps (on the previous page) so all of your pupils understand how this works.

Introducing workbook exercises:

1. Start every session with the flashcards. Explain that each pupil adds new flashcards as they progress through their workbook--point out the directions in the black bar at the top of pages 4 and 8.
2. Pass out the stopwatches and demonstrate how they work.
3. Tell pupils to turn to page 2. Nominate pupils to read it. Discuss.
4. Tell pupils that they must enter their times for the **Timed Exercises** on page 3.
5. Tell pupils to do the first exercise on page 4. Circulate and help any pupil who doesn't understand it.
6. Next, pupils will complete the Timed Exercise. If you have only one stopwatch for each pair, they will have to start the exercise at the same time. Make sure all pupils record their times on page 3.

Day 3

Assigning targets for timed exercises:

Your more able pupils will complete the timed exercise in under 1.15 minutes. They can progress straight to **Level 2**—*they do not need to do Lessons 2 and 3.*

Pupils with times between 1.15 and 1.30 minutes will probably achieve <1.15 minutes in the next two lessons. If a pupil consistently achieves a time of <1.15 minutes, this will continue to be their target. These pupils are in the **A-stream**.

Pupils with times between 1.30 and 2.00 minutes should be able to reduce their time to <1.30 minutes after completing the three lessons at each Level. They must always do all three lessons at each level, even when they meet their target. These pupils are in the **B-stream**. Encourage them to aim for a time of <1.15! Of course younger pupils are much more likely to be in the B stream.

SEN pupils:

Pupils with times >2.00 minutes will still have to achieve a minimum time of 1.30 to progress to the next Level. They will need a lot of practice with the flashcards to do so. Encourage them to use them during breaks—it may even be worth giving them a spare set to use at home with their parents.

The slowest pupils need not attempt a timed lesson every session. They can start the session with the flashcards, complete one of the two written exercises in each lesson, and then finish with the flashcards again. In extreme cases, it may be necessary to set a higher target—say, 1.45 minutes.

Dyspraxic pupils can move up a level if they can complete all of the flashcards for the current level with an average time of 2 seconds. This test should be monitored by the teacher or TA.

Progress Tests

The first progress test is on page 22. Your pupils are amazed when they find out how much their times have improved.

The most able pupils will take the first progress test within 2 or 3 weeks of starting, and the slowest will take at least 8 to 10 weeks.

However, this is a chance for your SEN pupils to shine: they will be the ones who have made the most dramatic progress on this test. Post their times--showing how much they have improved--and you will make their day!

Prize Competition for Addition

The test on p 42 must not be completed on the same day as the last progress test on p 41. Fill in 'Gold', 'Silver' or 'Bronze' on the line above 'AWARD'. Then sign it with the date. Pupils can cut it out of the book, colour it in, or take it home.

Moving on to Multiplication

The multiplication lessons work exactly the same as the addition lessons. However, you will have to administer the **Placement Test for Multiplication** on p. 45, and it may be necessary to change pairings of some pupils. We have found a few pupils who are much better at multiplication than addition.

Obviously, this is the time to get the multiplication flashcards out of the cupboard!