

## SAMSON Maths, is it really that strong?

Zoeh Speight

gw17speightzoeh@glow.sch.uk

### Background

SAMSON Maths was created after the results from the Scottish Survey of Numeracy stating there was an apparent fall in numeracy. Its aim was to create a structured and systematic programme for mathematics that could work in any school and that any teacher could deliver with minimal preparation and maximum impact on learning. It was then decided at Moffat Academy using PEF funding to introduce SAMSON Maths to all S1 during registration periods.



### Aim

The aim of this research project was to find out if through SAMSON Maths' techniques of continuous practice of Numeracy, followed by discussion of key mental Numeracy strategies, improve pupil's skills, knowledge and results and ultimately reduce the attainment gap.

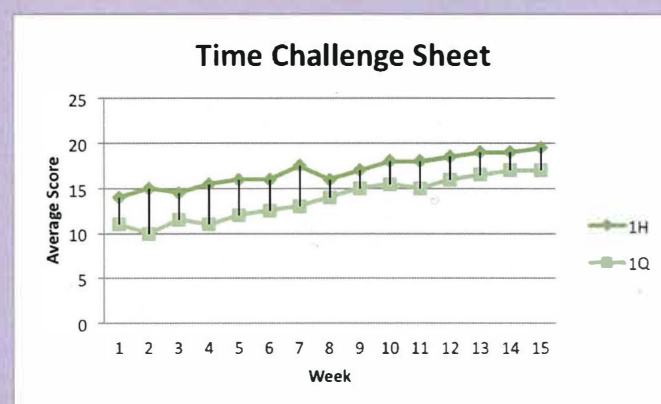
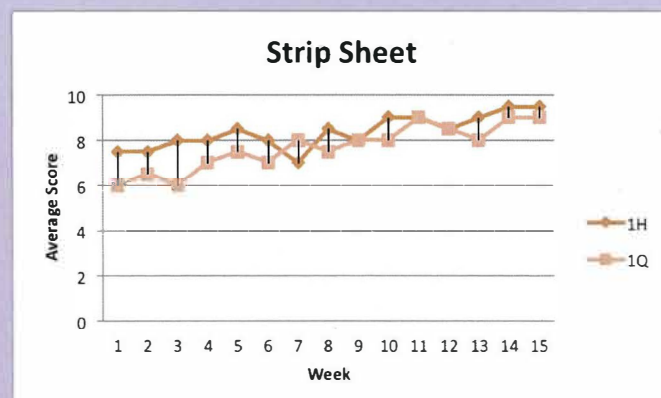
### Methodology

SAMSON Maths is a whole school intervention run in S1 registration periods. In each period pupils attempt either a 2 minute skills test, known as a Strip Sheet, which includes 10 questions on mental numeracy calculation strategies, or a 3 minute skills test, known as a Time Challenge Sheet, which includes 20 questions on key topics that are related to the CfE curriculum. The tests are marked in class by pupils and their scores recorded in their SAMSON Maths jotters.

This method of retrieval and interleaving by the revisiting of skills ensures students' improve their numeracy skills and that these are retained over time. It also allows the opportunity for teachers to develop an interactive teaching style that is backed up by questioning and discussion with the pupils. It also gives pupils the chance to succeed regardless of ability.

### Findings

The graphs show the data for both the Strip Sheet and the Time Challenge Sheet. As can be seen from both graphs there is a general positive trend indicating a consistent improvement across both S1 classes. Specifically looking at the Time Challenge Sheet, it can clearly be seen that the attainment gap between 1H and 1Q has closed and is continuing to.



### Conclusion:

From speaking to both S1 classes I found that they both really enjoyed doing SAMSON Maths in the mornings with the only complaint that it was full speed ahead from 9am onwards! I found that as the weeks progressed the pupils were more willing to ask and answer question as their confidence grew and scores increased.

### Impact on Future Practice

Due to the positive results from the introduction of SAMSON Maths to the S1 PSE course, I would definitely consider using this or another form of this with other classes, not only with S1, in the future.



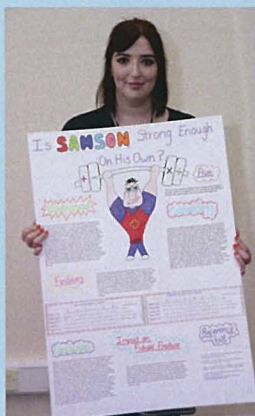
## Is SAMSON Strong Enough on His Own?

Maria Marscheider

gw17marscheiderayesh@ea.dumgal.sch.uk

### Background

My school purchased the 'Strong Maths' programme in 2017 and rolled the programme out to P1-P7, meaning my P5s were starting fresh with it in August. I found it interesting that Samson promoted teaching the class a mental maths strategy as one large group, as opposed to the traditional ability groupings. Samson talks of 'maths mastery'; meaning each learner achieves secure understanding of the 4 procedures (+, -, x, ÷). Samson states: "They can then apply their understanding of maths concepts and procedures to solve different types of problems including when the skill is embedded in a different context or where a choice of method has to be made: mastery means they really know it!" (Strong Maths, 2016). So, how can we measure this against the old system of differentiated groups and rote-style learning? Some of our PEF (Pupil Equity Fund) money this year was spent on a Learning Assistant who would target children who live in certain postcodes and measure their progress in numeracy and literacy to see whether the targeted support helped to bridge the poverty related attainment gap (Scottish Attainment Challenge, 2015). This is how I planned to measure the impact of Samson versus traditional rote learning.



### Aim

The aim of my research project was to measure the impact of Samson maths on multiplication and compare those findings to children who were taught their times tables through rote.

### Methodology

I grouped the children by giving the whole class the same 25 question sheet with a mixture of times tables on it and giving them 2 minutes to complete it. The group of 5 who would be working with the Support for Learning Assistant (SLA) were chosen already from a list of identified postcodes by the Scottish Government to receive PEF targeted support (Group 1). Then, I chose the other group of 5 (Group 2) by their test scores,

just like I would normally do to make a maths group. I collected all the results over a 5-week period, with week 1 beginning on the 15th of January and finishing on the week beginning 12th of February. I used Samson Strip Sheets (SS) twice a week with the class and during this time, Group 1 worked with the SLA. I taught the class using the Samson Number Wagons and Flip Charts, going over all 10 questions on the SS in depth, teaching the strategy laid out by Samson Maths. The children then completed their 10 question SS under timed conditions, getting 2 minutes to try and complete it. At the same time, Group 1 would be working individually with the SLA. I made flash cards with the same 10 questions the SS had on it, so all children were getting the same questions, just taught by a different method. The SLA then gave each child 2 minutes to get through the 10 questions.

### Findings

The results over the 5 weeks were extremely varied but overall, the learners improved their scores in multiplication. The children who used rote showed greater improvement in their scores on a weekly basis, whereas the Samson group showed steadier progress. The main difference showed in Week 5, with the introduction of 2 digit (higher than 12) numbers multiplied by a single digit number. The children who had followed the Samson programme could use the learned strategies and apply it to the larger numbers and their scores reflect this. The children who only used the rote method could not apply that to the larger numbers, as it relies on memory as opposed to a learned strategy.

### Conclusion

Mayer (2002) states that the two most important aspects of learning are 'retention' and 'transfer'. Retention is the ability to recall learning and present it in the same way it was presented to you at the time and transfer means to use knowledge in a new way to solve new problems (Mayer & Wittrock, 1996). In this instance, rote presents itself as retention and Samson as transfer. Mayer suggests the two must go hand in hand to be truly effective and this shows in everyday numeracy in the classroom. The strategies taught by Samson are essential for the transfer of knowledge, but some learners need rote to build the foundations, allowing them to progress. Rote learning still has a place in the classroom and if it is used in conjunction with a learned method and not as a stand-alone strategy. Samson has been a hit with my class and although they are still new to it, they are enthusiastic in



# Primary School Projects

## Have you got the SAMSON factor?

Katie Griffin

gw16griffinkatie@ea.dumgal.sch.uk

### Background

Since the start of my time at St Andrew's RC Primary School, we have been encouraged to implement Samson maths in our classes as the central mental maths programme.

Children have picked it up quickly and found it great fun – learning the character names, using the flipcharts, and trying to beat their own scores and times in their daily assessments. However when we reached the subtraction block, their smiles faded and they began to struggle with mental subtraction. It is then that I realised the children lacked confidence.

### Aim

The aim of my research was to assess whether the Samson approach to mental maths could raise attainment in my Primary 5 class.

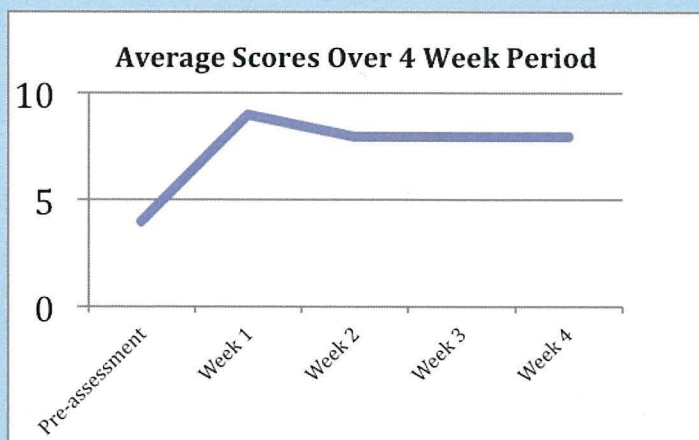
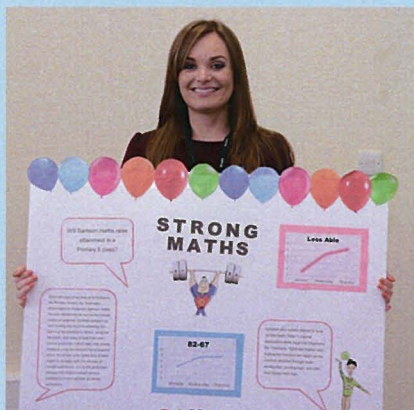
### Methodology

In order to measure whether the children's ability in mental subtraction was improving, I decided to split my study across a four-week period. Children would receive a new maths test each Monday, and they would complete each test 3 times per week. I would look at each score and check if the scores were improving.

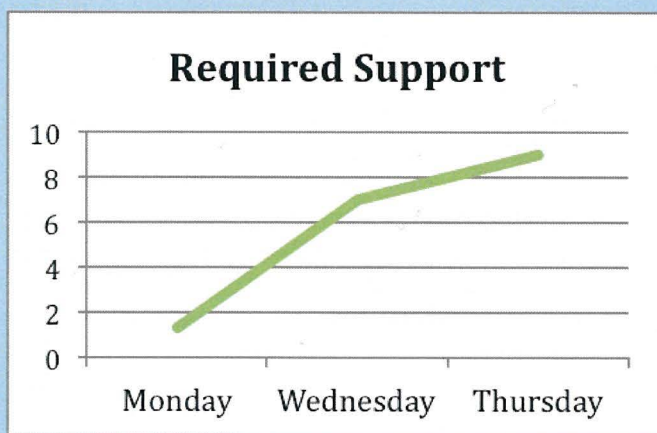
Weeks one and two were based on the 'easier' subtraction method, and weeks three and four were based on the trickier approach, where children would be introduced to Step 1 and Step 2. Alongside the tracking and monitoring of scores, I also looked at whether Samson maths could, potentially, be taught as a whole class lesson, and differentiate by support and visual aid, rather than varying the levels.

### Findings

Data gathered from the Samson score-tracking sheets, showed that the majority of the Primary 5 class improved scores over the four-week period. The graph below shows the average scores of the class from the beginning of the project to the end.



As we can see the graph dips slightly, at Week 3, however this was the week when the class attempted the more difficult method of Subtraction (Step 1 and Step 2), which involved the children using their knowledge of number bonds and counting on, in order to find the difference.



A large majority of the class, initially, found this method extremely difficult, and required further support to understand this strategy. Using my knowledge of the class, I understood that a visual aid may just do the trick, and created a number line on the interactive whiteboard. Here, I asked children to imagine stepping along the tightrope (tiptoeing for units, and large steps or jumps for tens). For many, this idea was enough and they did not require further support however certain individuals still found it difficult to remember each step. For this group, I allowed them to use whiteboards to create their own number lines for each question, drawing their steps and jumps. This was extremely successful and saw up to 10 pupils move from 0 or 1/10 to 9 and 10/10. This was a huge success and spurred a great sense of enthusiasm in the class. The left-hand graph (blue) illustrates the average scores from Monday to Thursday in Week 3, and the considerable increase. The right-hand graph (green) highlights, in that same time period, the tremendous improvement of the children who required support.



## Mental Maths...Give me strength!

Craig Dolderson

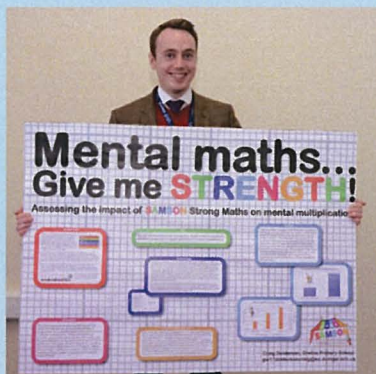
gw17doldersoncraig@ea.dumgal.sch.uk

### Background

My school is one of a number of primary schools in our cluster that has chosen to use the Strong Maths SAMSON programme to support attainment in numeracy from Primary 1 to Primary 7. Through SAMSON, pupils are taught mental arithmetic strategies as well as number bonds and table facts with the aid of illustrated interactive whiteboard flipcharts. The learners then practice these concepts by completing questions independently in a given time. One of the key pedagogical theories underpinning SAMSON is that of 'mastery learning' – an instructional strategy first mooted by Bloom in 1968.

While definitions in the literature vary (National Association of Mathematics), generally speaking, mastery learning proposes that learners acquire a degree of mastery in a given subject or concept prior to moving on to acquire further knowledge or skills. In SAMSON, the learners are expected to master each strategy or arithmetical operation prior to progressing on to the next skill. Mastery is assessed by observing and recording improvements in each pupil's total score in independent questions, as well as any reduction in time taken to answer them.

Given that this is the first year that both the school (and myself) have used SAMSON, I was interested in evaluating the impact - if any - the programme would have on an area of numeracy that my class were less secure with. While my Primary 3/4 class were generally confident in mental addition and subtraction, on baseline assessment a significant number of the pupils scored either at – or critically below – the level expected for their age for mental multiplication. With these assessment findings in mind, I set out to establish if the SAMSON approach could help boost my class's attainment in mental multiplication.



### Aim

The aim of this enquiry was to assess the impact of the Strong Maths SAMSON programme on pupils' proficiency in mental multiplication.

### Methodology

The enquiry was undertaken over a four-week period. Prior to the investigation, the class had received very little 'formal' teaching of multiplication from myself up until that point in the academic year. In line with current practice in the school, all pupils in the class received daily sessions of SAMSON maths covering multiplication lasting approximately 20 minutes - in addition to 'regular' lessons in numeracy and mathematics. Each lesson consisted of working through, and modelling with the class, strategies for how to solve multiplication calculations supported by 'off the shelf' interactive whiteboard flipcharts from the SAMSON programme. Pupils were then given the opportunity to apply multiplication strategies and table facts independently by completing either a 'Time Challenge Sheet' of twenty calculations using formal layout, or 'Strip Sheets' of ten mental calculations. Pupils were given five minutes to complete the Time Challenge Sheets and three minutes to complete the Strip Sheets. After checking the answers as a class, total scores and the time taken to answer were recorded.

Data were obtained for 19 of the 20 pupils in the class. One individual was excluded from the enquiry due to significant additional support needs. Mean scores and times for the completion of mixed multiplication tables Strip Sheets were recorded and compared for weeks 2, 3 and 4 of the enquiry. An assessment of mental multiplication was undertaken following the enquiry period and was compared with baseline data obtained before the study.

### Findings

