**Struthers Primary Numeracy Guidance – updated Jan 2019**

Rights Respecting Schools

Article 28 : Your right to learn and to go to school.

Article 29 : Your right to become the best you can be.

**Rationale**

The purpose of this policy is to give guidance to staff and create a shared understanding of the language of maths; features of a high quality maths lesson; and expectations in relation to pace within maths throughout a week.

Maths Mastery approaches are being embedded through termly Maths Mastery focuses shared with staff, pupils and parents.

**Long term planning - Maths Pathway**

Maths pathways should be planned at the beginning of the session to map out when experiences and outcomes will be covered throughout the year. This is to guarantee good pace of learning whilst ensuring time for depth of learning to take place. A focus should be on number throughout the year and this should be evident in maths pathways. Outcomes to be assessed should be carefully selected and mapped out at the start of the session to ensure coverage across all numeracy organisers.

**Maths Medium Term planning**

Previously selected experiences and outcomes should be dropped into the numeracy medium term planning or IDL planning, along with benchmarks. Learning intentions and success criteria should then be devised, followed by assessment tasks being planned to assess pupils learning. Numeracy across Learning should also be evident in IDL planning.

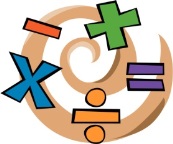
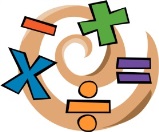
**Short term planning - Maths in a week**

Throughout a week, numeracy should be taught 5 times, with a maximum of 20 minutes spent on mental maths, and the rest of the session focused on general maths. Pupils should also be provided with daily problem solving challenges. This can be linked in with learning taking place in mental maths, general maths or a stand alone challenge. Problem solving challenges should develop pupils understanding of the language of maths.

**Language of Maths**

To ensure consistency throughout the school and to support children in being able to solve problems, ‘language of maths’ posters have been created and distributed to each class. Teachers should use these posters when writing word problems so pupils are exposed to a variety of language used in maths. Pupils should be given the opportunity to solve and share solutions to problem solving tasks daily.

Example problem solving tasks are provided in the [staff shared area](file:///S:\Numeracy\Maths%20Mastery\Problem%20Solving%20resources).

**Struthers Primary School**

**Common words used in calculations**

**Addition**

**add**

**plus**

**sum of**

**more than**

**total**

**altogether**

**Subtraction**

**take away**

**subtract**

**less than**

**minus**

**reduce**

**difference**

**Equals**

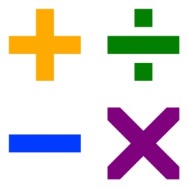
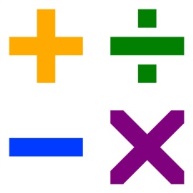
**makes**

**same as**

**is equal to**

**will be**

**same value**



**Division**

**divide**

**share**

**split**

**quotient**

**Multiplication**

**times**

**multiply**

**product**

**groups of**

**sets of**

**multiplied by**

**Mental Maths and Problem Solving**

Mental Maths in Struthers Primary follows the Big Maths and Number Talks programmes. Time taken to deliver mental maths should be a maximum of 20 minutes. Pupils should be faced with daily word problems to solve and share their strategies so pupils are able to apply their learning in new contexts. In most cases, this will form part of mental maths sessions, however this can take place during general maths, a plenary or a stand alone challenge e.g. as a starter task after snack time.

|  |  |
| --- | --- |
| **Counting – I can partition a 2dp number**  **1. 52.94**  **2. 23.19**  **3. 34.25**  **4. 204.21**  **5. 123.09** | **Learn Its – I know my 7 times tables**  **Write out the 4 calculations for these 7 times table facts families.**  **7 x 3 = \_\_ 56 ÷ 7 = \_\_**  **\_\_ x \_\_ = \_\_ \_\_ ÷ \_\_ = \_\_**  **\_\_ ÷ \_\_ = \_\_ \_\_ x \_\_ = \_\_**  **\_\_ ÷ \_\_ = \_\_ \_\_ x \_\_ = \_\_** |
| **It’s Noting New – Round the numbers to the nearest whole number**  **1. £143.41**  **2. £172.99**  **3. £298.75**  **4. £439.23**  **5. £575.24** | **Calculations – I can calculate fractions of quantities**  **1. 3**  **4 of 160**  **2. 1**  **10 of 540**  **3. 2**  **4 of 280**  **4. 1**  **5 of 950** |

Below are some examples of formats for Big Maths, Number Talks and Problem Solving challenges.

**Big Maths**

**Number Talks**

**Solve the problem as many ways as you can in 2 minutes.**

**Don’t forget to show your working for each strategy!**

|  |  |  |
| --- | --- | --- |
| **What is the sum of 23 birds and 38 birds?** | | |
| **My Calculation:** \_\_\_\_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_ | | |
| **Strategy 1** | **Strategy 2** | **Strategy 3** |

**Problem Solving**



**What does a Maths Lesson look like at Struthers?**

* **Mental Maths and problem solving starter activity – 20mins**

Pupils get started on this as soon as they enter the class on whiteboards. Paper/jotters can be used when appropriate to assess progress.

* **Connect Learning with Prior Learning, Learning Intention and Success criteria**

A description of the context of the lesson and any prior learning should take place. Learning intentions should be shared and success criteria co-created with the pupils if appropriate for the learning taking place. These should be referred back to throughout the lesson for pupils to ensure they are on track.

* **Anchor Task - Learning broken down into small steps with particular focus on areas which will be difficult or where misconceptions may be**

The anchor task may consist of a series of questions and short tasks, breaking down the learning into small, manageable steps. Repetition of language and correct terminology should also be used to help reinforce this to children. This time will give pupils and staff an opportunity to assess pupil understanding.

* **Concrete – pictorial – abstract**

Even in the upper school, pupils should still have the opportunity to use concrete materials to aid understanding. Concrete materials should be used regularly in the lower classes. Pictorial representations should also be used by the teacher and pupils to help explain their methods. Please see below for more resources linked to the CPA approach.

* **Answers in sentences to explain thinking**

When answering questions, pupils should be discouraged to simply state or record their answers. ***Answers should be given in sentences*** and with working or explanations to support this. This can be shown using concrete, pictorial or abstract representations.

* **Independent tasks to Demonstrate Understanding**

Carefully selected tasks will be provided by the class teachers to allow pupils to demonstrate their understanding and to provide opportunities for teachers to assess their understanding. In the upper school classes, a choice of tasks are available for pupils to choose from depending on their level of understanding. Tasks are called Mild, Spicy and Very Hot to provide support and challenge for all learners.

* **Plenary to Review and Recall Learning**

Plenaries should be used to revisit learning intentions and success criteria for pupils to self-assess their progress and identify next steps in learning. This can also provide a good opportunity for problem solving tasks linking in with the learning intention to assess understanding of application.

The following link gives video examples of Numeracy and Mathematics lessons using Maths Mastery techniques across different stages.

[**Link to Videos of Maths Mastery Lessons**](https://www.ncetm.org.uk/resources/48209)

* **Resources**

Please access the [Maths Mastery](file:///S:\Numeracy\Maths%20Mastery) folder which can be found in the numeracy folder in the staff shared area for Maths Mastery resources. Additional resources can also be found on TES using the following link: **[TES Maths Mastery Resources](https://www.tes.com/teaching-resources/teaching-for-mastery-in-primary-maths/whiterosemaths)**

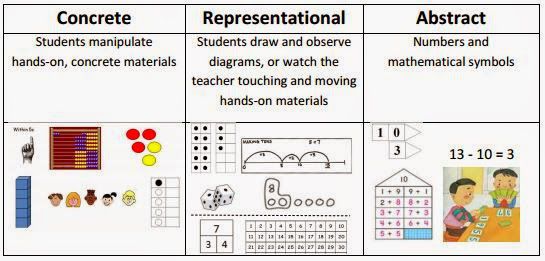
* **CPA Approach**

**Concrete** - The “doing” stage - Each math concept/skill is first modelled with concrete materials or experiences (e.g. paper folding, algebra tiles, unifix cubes, base ten blocks, pattern blocks).

**Pictorial** - The “seeing” stage - The math concept/skill is next modelled by drawing pictures that represent the concrete objects previously used (e.g. tallies, dots, circles, stamps that imprint pictures for counting, strip models).

**Abstract** - The “symbolic” stage -. The math concept/skill is finally modelled at the abstract level (using only numbers and mathematical symbols).

[Click here to see examples of CPA for the 4 number process](http://www.st-pats.co.uk/index.php/headertest/2-uncategorised/236-calculation-policy)

[](https://www.google.co.uk/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8&ved=2ahUKEwiSpZvB7PXaAhUFY1AKHWy_ChcQjRx6BAgBEAU&url=https://www.pinterest.com/pin/16607092354674315/&psig=AOvVaw03psjwffA-_sNHQLh3dqfj&ust=1525859114323465)