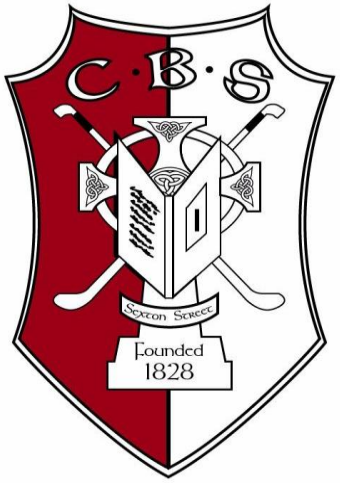
Scoil Íosagáin



Numeracy Plan 2017-2020

Scoil Íosagáin	DEIS Action Plan	2017-2020

Numeracy

Targets

1. Every child will be individually profiled and tracked in each maths strand on a yearly basis with a view to maximising all children's progress
2. Raise the level of competency in Problem Solving by 5% through a whole school programme of focusing on this area.
3. Reduce the number of Pupils under the 16th percentile in Shape & Space by 5%
4. Provide Guidance for parents so that the level of support that parents feel necessary declines to 50%
5. Reduce the percentage of pupils attaining under the 2nd percentile in Data Handling by 2% through intense emphasis on this area.
6. Explicitly teach the language of Maths

Targets	Actions Year 1-2017-2018	Actions Year 2-2018-2019	Actions Year 3-2019-2020
1. Every child will be individually profiled and tracked in each maths strand on a yearly basis with a view to maximising all children's	Engage with the PDST for continued support [also T2, T3, T5 & T6] Engage in Lesson Study to look at current practice in a sample	Compile and analyse Sigma T results to identify pupils that are in need of support and/or advancement in each strand [also T2, T3, T5 & T6]	Sigma Ts to be compiled and analysed again. Results to be compared with those of 2018/2019 – this will identify progress made and needs to be addressed and will inform

progress	classroom [also T2] Trialled team teaching in the classroom [also T2, T3, T5 & T6]	Profile each child based on Sigma T percentile range. Identify children who may possibly need support to avoid falling into lower percentile range and also children who can be progressed to next percentile range [also T2, T3, T5 & T6] Children will be tested after each strand is completed in class [also T2, T3, T5 & T6] Transition to a new model of team teaching which will enable teachers to target specific areas of weakness and to incorporate the use of more concrete materials [also T2, T3, T5 & T6] Purchase additional concrete materials [also T2, T3, T5 & T6] Second class teachers to attend Teaching Number in the Classroom training. Teacher to train in Maths	planning for 2019/2020 [also T2, T3, T5 & T6] Profile each child based on Sigma T percentile range. Compare performance from 2018/2019 - this will identify progress made and needs to be addressed and will inform planning for 2019/2020 [also T2, T3, T5 & T6] Explore suitability of implementing Maths Recovery based stations.

		Recovery. Pilot in 2nd Class – Teaching Number in the Classroom. Phase II to include a visit to another DEIS school to see Maths Recovery based stations in operation.	
2. Raise the level of competency in Problem Solving by 5% through a whole school programme of focusing on this area.	Create a problem of the week for each class group. 6th Class to enter VEX competition. 4th & 5th Class to engage with Lego We Do and Scratch. Participate in Maths Week activities [also T3, T5 & T6] Involve children in 'real world' maths to demonstrate how relevant and meaningful maths	Adopt a consolidated whole school approach to problem solving. 3 teachers to attend 2 Problem Solving workshops facilitated by Mary Immaculate college. Explore problem solving and inquiry-based learning through STEM programmes such as Lego We Do, VEX IQ, Scratch and IZAK 9 from 4th to 6th classes. Survey each child to establish a baseline of their understanding of and their attitudes towards	Expand problem solving strategies and Polya's approach across curriculum [also T3 & T5] Devise a whole school STEM action plan which will detail a clear pathway of progression from 2nd class to 6th class. Expand the STEM programmes to 2nd and 3rd classes.

3. Reduce the number of Pupils under the 16^{h} percentile in Shape & Space by 5%	can be [also T3 & T5]	STEM. Survey teachers to capture their engagement with STEM and any CPD needs. PDST CPD on Inquiry Based Learning in Maths & Science through SHAPE & SPACE in term 3 Booklets will be distributed to parents to explain the language and process used in the teaching of Maths in Scoil Íosagáin.	Increase use of concrete materials while exploring shape & space – this will encourage pupils to progress from thinking of shapes as whole images to thinking of the properties of shapes or parts of shapes. Create a booklet of process and mathematical language to be distributed to parents, pupils and staff alike for uniformity in the teaching if mathematics.
4. Provide Guidance for parents so that the level of support that parents feel necessary declines to 50%	Enhance baseline data by developing and distributing surveys to canvass attitudes and opinions towards the subject of mathematics for parents and pupils of school.	Provide classes in mathematics to parents. Increase communication with parents via the school website & Facebook page.	

5. Reduce the percentage of pupils attaining under the 2nd percentile in Data Handling by 2% through intense emphasis on this area.		Develop children's mathematical language around data handling through explicit teaching [also T6] Implement a CPA (Concrete – Pictorial – Abstract) approach to enable students to acquire a thorough understanding of representing and interpreting data [also T2 & T3] Use data sets that are relevant to the children to encourage an appreciation of how relevant this strand is to them. Maths trails to explore maths in the environment. Data will be represented and analysed and displayed in each class.	Link data handling with other strands in Maths where possible (2D & 3D shapes, lines and angles etc.) [also T2 & T3] Integrate data handling with other subjects for example, collecting and displaying data in Science and Geography. Develop the higher order skill of conceptually being able to analyse data and draw conclusions and interpretations.

6. Explicitly teach the language of Maths	Display maths language boards in every classroom [also T2, T3 & T5] Create Maths posters in a variety of Languages to help engage EAL learners.	Maths language classes for EAL pupils [also T2, T3 & T5] Multi-lingual maths posters displaying language of operations in all classrooms [also T2, T3 & T5] Teachers to explicitly teach maths language [also T2, T3 & T5]	

DEIS Plan –Numeracy

Rationale

Summary of main strengths	● We were very encouraged that pupils have a very positive attitude towards Maths.68% of children felt that it was their favorite subject. ● 63% of pupils said that they liked maths whereas only 14% expressed a dislike for maths. This was further highlighted by 87% stating that they saw maths as part of their future and 71% stating that they use maths in their daily lives.

	• Over half the children liked mental maths and only 9% stated that they disliked it. Also an encouraging statistic was that 31% even liking challenging maths. • Almost 2/3rds said that they liked working out written problems. • When parents were surveyed 94% of them felt that their child had a positive attitude towards maths. 68 % of parents themselves expressed that their own relationship with maths was positive. • 68% of parents engage their children in informal practical maths activities on a regular basis. • 16% of the pupils preformed above the 85th percentile in the Sigma tests in 2016-17 indeed this is above the national average
Summary of main areas requiring improvements	• 24% of children performed below the 16th percentile for Sigma T in 2016-17 • 72 % of parents felt that they would benefit from some guidance in helping their children with Maths • 47% of parents never play mathematical games with their children • Parents believe that Fractions and Decimals were the areas that children had most difficulty with. This was closely followed by Interpreting Graphs. • Word Problem solving • Mental Maths • Data Handling • Communication with parents/guardians

MATHS LANGUAGE

We will develop lists of mathematical language to be taught discretely. This language forms part of the school plan and outlines from class from class language to be taught.

Simple ideas like flashcards, word walls and word wheels, maths dictionaries and math thesaurus along with incorporating this mathematical language in weekly teacher designed tests and tasks can improve many key components of the skillset children need to problem-solve.

Math vocabulary within each lesson is identified and defined at point of use. Students also have the opportunity to define vocabulary words using their own words, drawings, and examples to create their own personal math glossary. This writing activity helps students organize, clarify, and refine their understanding of important math-related vocabulary.

COGNITIVELY CHALLENGING TASKS

On our school maths plan, we looked at the possibility of exploring maths problem solving, reasoning and communicating & expressing skills in our maths teaching. Within this we want to provide more cognitively challenging tasks to pupils to develop their maths language and strategy sharing skills through using the Low Threshold High Ceiling tasks. We also looked at the possibility of developing mental maths and fluency with number / number sense though 5 minutes warm up activities as part of our maths lessons across the school.

We will also explore Team Teaching through the lens of Maths and how team teaching can help us meet the needs of all pupils under the new SEN guidelines.

The types of problems pupils engage with and affording them opportunities to share strategies for mental maths and problem solving is key to their success.

Problem-solving skills:

- Trial and improvement

- Working systematically
- Pattern spotting
- Working backwards
- Reasoning logically
- Visualising
- Conjecturing, generalising & proving

Low Threshold High Ceiling Tasks

These are tasks that all students can access but can be extended to high levels. They allow pupils to work on the same task but at different paces and take the work to different depths i.e. work at their own level of engagement. These kinds of tasks are important because all classes are heterogeneous.

A LTHC task is a mathematical activity where everyone in the group can begin and then work at their own level, yet the task also offers lots of possibilities for learners to do much more challenging mathematics too.
LTHC tasks provide opportunities for all children to work like mathematicians. While the content within these tasks can be quite simple, the level of thinking required is sophisticated. In this way LTHC tasks fit very well with the aims of the primary mathematics curriculum around communicating, reasoning and problem solving. Developing problem solving skills alongside the conceptual understanding that LTHC tasks offer provides valuable opportunities for children to think mathematically.

LTHC tasks also promote a positive classroom culture because the whole class are working on the same activity. LTHC tasks offer activities which are

suitable for pretty much everyone, allowing the less confident learners to stay close to the original task. LTHC tasks also offer an opportunity to those learners who may not otherwise choose to explore the mathematics in different ways.

CLASSROOM CLIMATE

The importance of classroom climate is key for pupil success in Maths. We must afford all pupils an opportunity to experience success at Maths. There will be multiple opportunities for pupils to discuss and share strategies during our maths lessons. We will also develop a culture where:

- **Knowledge is shared:**
  - Strategy sharing (mini-plenary, ambassadors, re-voicing etc.)
  - Peer to peer learning
  - Build on knowledge in the room
- **Mistakes are valued:**
  - Unsuccessful attempts may form the basis of successful solutions
  - "Well done, what have you learned?"
  - "Mistakes should be accepted, respected and inspected" (Jo Boaler)
- **Struggle is productive:**
  - Teachers value effort over answers.
  - Answer is only part of a greater effort.

Teachers play a vital role in establishing a safe, collaborative and productive classroom climate. Mindset also affects pupils' attainment in maths. It is the teacher who establishes a climate where a growth mindset can flourish.

The teacher also plays a central role in facilitating classroom discussion, by modelling language in context, revoicing and expanding on pupil contributions, ensuring all pupils participate in discussion, recording language on living charts so pupils become familiar with it. The higher order thinking skills (HOTS) are essentially developed through this discussion, as pupils provide reasoning for their chosen strategies, integrate and connect maths skills and content and become confident at communicating their approach.

DEVELOPMENTAL EXPERIENCES AND TEAM TEACHING

Team teaching will be used as a teaching intervention to help enrich pupils learning experiences in Maths. When learning a new concept in Maths, children need to have an experience of the Concrete and Pictorial during activities before moving to the Abstract which is generally the experiences found in textbooks. Maths needs to be relevant and linked to real-life experiences for the pupils.

INVOLVING PARENTS

Involving Parents – a letter each year to explain how the text book will be used to assist in teaching the maths curriculum but it is not the only method used. There are parts of the curriculum that are better taught through activities and other learning experiences, therefore the textbook may be incomplete at the end of the year. This does not mean that the curriculum has not been covered by the class teacher.

Assessment – use of pupil learning logs and self-assessment. Not an overreliance on teacher designed tests and standardised tests.