

ST. PATRICK'S NATIONAL SCHOOL

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Mathematics

School Policy

2023

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1. Introduction

1.1 Introductory statement

As part of in-school planning in 2023 the Maths plan was reviewed and necessary changes were identified. The areas of focus were

- equipment / resources,
- Maths methodology and language
- homework
- home/school links
- making optimum provision for the gifted child
- policy on ICT
- assessment and record-keeping
- The use of the school buildings and campus as a resource to support the Maths programme (ref 3.2).

1.2 Rationale

This plan is a record of whole school decisions in relation to Maths in line with the *Primary Curriculum (1999)*. It is intended to guide teachers in their individual planning in Maths. It will be reviewed and updated in 2024 in line with the implementation of the new Maths Curriculum vision and aims for the 2025/26 academic year.

1.3 School characteristic spirit / ethos

In line with the school's characteristic spirit, this plan will focus on meeting the needs of our pupils in Maths. Parental involvement will be encouraged as much as possible to support their child's learning in Maths.

1.4 Aims and objectives

We endorse the aims of the *Primary Curriculum, Mathematics (1999)*, p 12.

2. Content of Mathematics plan

2.1 Strands and strand units

The Curriculum objectives are used as the objectives for each class level in our school:

Junior and Senior Infants: Curriculum pp. 20 - 35

1st and 2nd Class: Curriculum, pp 40 - 59

3rd and 4th Class: Curriculum, pp 64 - 83

5th and 6th Class: Curriculum, pp 88 - 111

At the beginning of each academic year teachers will familiarise themselves with the objectives for their class and make sure that their individual planning for the year incorporates all strands of the Maths curriculum.

2.2 Approaches and methodologies

Various approaches and methodologies are used throughout the school.

3.2.1 The use of manipulatives

Children will have access to, and use, a broad range of mathematical equipment to support all strands. (ref Resources)

3.2.2 Talk and discussion

Talk and discussion is seen as an integral part of the learning process and opportunities should be provided during Maths class for children to discuss problems with the teacher, other individual children and in groups, active learning and guided discovery.

As part of the Maths for each class, children are provided with structured opportunities to engage in exploratory activities under the guidance of the teacher to construct meaning, to develop mathematical strategies for solving problems, and to develop self-motivation in mathematical activities. These activities should be outlined in the teacher's long- and short-term planning.

3.2.3 Using the environment as a learning resource

The use of the school buildings and outdoor area is promoted as a maths resource across all class levels. There are maths trails available to teachers for use and engaging in cross-curricular maths activities is encouraged, e.g. using the hall for P.E. that involves maths such as outdoor & adventure activities including orienteering.

The following number limits for each class will be adhered to:

Class	Numerals
Junior Infants	0 - 5 (comparing) 0-10 (counting)
Senior Infants	0-10 (comparing) 0-20 (counting)
1 st Class	to 99
2 nd Class	to 199
3 rd Class	to 999
4 th Class	to 9999
5 th Class	to 100,000
6 th Class	to 1,000,000

2.3 Data

Children are encouraged to collect and read real life data e.g. infant classes collect personal information and represent it on a pictogram; older children conduct surveys of other classes and create and interpret bar charts and pie charts.

2.4 Language - concepts and skills

There is a strong link between language and concept acquisition. Our school has agreed on a common teaching approach to areas of difficulty (subtraction/multiplication/division) to ensure continuity and consistency, and the correct use of symbol names.

Several agreed approaches include

- The term 'units' will be referred to as 'units' and not 'ones'. Until 4th Class where they will be introduced to both terms. In fifth and sixth class the terms will be used simultaneously.
- The + symbol will be introduced in Senior Infants as 'plus'. Addition sentences will also use the phrases 'add on' and 'and'. The term 'sum of' is introduced in 2nd Class.
- The digit '0' will be referred to as 'zero' (not 'oh!') when introduced to Infant classes. The pupils will also know that it is sometimes called 'nought'. From Fourth Class on, the children will begin using all terms.
- The '-' symbol will be referred to as 'take away/ minus/ subtract' when introduced in 1st Class. Correct word order is important e.g. $15-9$ is '*fifteen take away/minus nine*' not '*9 from 15 is*'. From 2nd Class upwards, children will be introduced to all other phrases requiring addition/ subtraction (e.g. '*find the difference between*', '*how much more/less?*', etc) as they will need to be familiar with these phrases for problem solving.
- Subtraction with re-grouping - the following method was agreed:

You can't take 6 away from 2, so we need to borrow from the tens

TU (Cross out 3, write 2)

34 You now have 14 units (write in 1). 14 take away 6 etc

16

This should be done initially with cubes and notation boards. A possible intermediate step for weaker pupils includes crossing out the 4 to write 14.

When regrouping numbers with many zeros, e.g. 7000, it was decided to adhere strictly to the steps, regrouping one number at a time. More able children may regroup it all together if they discover that themselves.

- Multiplication

While noting that strictly speaking '*multiplied by*' is not the same as '*times*', ie

'*3 multiplied by 2 is $3 + 3$* ' while '*3 times 2 is $2 + 2 + 2$* ', it was agreed to use both terms and to word the multiplication tables as '*3 times 2*' etc.

- Decimals

HTU

642. 05x 100

'*Each number will be 100 times bigger, which is like moving the digit 2 places to the left*'. A lot of work with concrete materials is necessary for this concept to be understood.

- Division

410/7

We will not use the terms '7 into 410', as that is not mathematically correct. It should be read as '410 divided by, or shared between, 7', e.g. *How many 7s are in 410?* etc.

- We will continue to place an emphasis on presenting problems in both a horizontal format and vertically.
- Fractions

In the addition and subtraction of mixed numbers, the whole numbers are worked on first, then equivalence is used for the fraction part by finding the common denominator.

$$5\frac{1}{4} + 3\frac{1}{2} = 8 + \frac{1}{4} + \frac{2}{4}$$

Children can also be taught the method of converting to an improper fraction with a common denominator and adding the two fractions.

Children are afforded opportunities to verbalise and to use manipulatives to represent each of these activities before the written recording of symbols.

- Tables

Number facts up to 10 will be memorised. Addition and subtraction facts will be memorised by the end of 2nd Class. There are 56 facts to learn over the course of 60 weeks. 1st and 2nd Class teachers should decide the order between them. Subtraction will be learnt as the inverse of addition.

Revision of addition and subtraction facts will be done in 3rd Class, as well as introduction to multiplication. The multiplication facts should be known by the end of 4th Class. Multiplication facts should be taught in related sets i.e. 2x, 4x and 8x, 3x 6x and 9x, 5x and 10x. 7x 11x and 12x. Division tables will be taught as the inverse of multiplication. Both will be revised up to the end of 6th Class. Regular timed tests may be given in 5th and 6th Class.

A variety of methods will be used in teaching maths facts including counting in 2s, 3s, 4s, ; reciting; and using music, loop cards, trio cards, number fans, counting sticks, number games such as elevens, buzz, Topmarks Daily 10 etc.

Each class from 3rd up will complete a times tables test at least two Fridays a month based on the current tables they are learning. 5th and 6th Class may also be tested three times a year with a timed tables test.

Games: Maths games will be used as a warm-up activity and maths games on the interactive whiteboard can be used to revise and conclude a topic.

Special Needs: Consideration must be given to pupils whose special educational needs mean that they may learn their tables at a different pace to other children and may need additional concrete resources and teaching around this. This is at the discretion of the teacher and use of concrete materials during informal assessment is encouraged if it helps the child reach their potential and build their confidence in Maths. Use of calculators may also be permitted to allow the older children to keep pace with their peers.

2.5 Skills

The following skills will be acquired by the children through the study of the various

strands in the Mathematics Curriculum:

- Applying and problem solving
- Communicating and expressing
- Integrating and connecting
- Reasoning
- Implementing
- Understanding and recalling
- Estimation

Every strand studied must provide opportunities for acquiring these skills. Opportunities should also be provided for the transfer of these skills to other areas e.g. Science, Geography, and Music. Evidence of skills development should be included in teachers' individual planning.

2.6 Problem Solving

Types of problems

- word problems
- practical tasks
- open-ended investigations
- puzzles
- games
- projects
- mathematical trails
- missing contradictory surplus data

Children are encouraged to use their own ideas as a context for problem solving. They will be taught to apply the following strategies:

- **RUDE** for 1st - 3rd class (and any children who need additional help in older classes)

Read: Read the question three times

Underline: Underline the key words or numbers with a pencil

Draw: draw pictures to help solve the problem

Estimate: Estimate a possible answer before solving it

C- choose numbers

C- calculate your answer

C- check if the answer makes sense

- **ROSE** for 4th - 6th class

Read: Read the question three times.

- **Organise:** Highlight the important information that tells you what to do and how to solve the question.
- **Solve:** complete the question.

Evaluate: check if your answer makes sense.

Solving the problem...

- read the problem
- read it again
- say, in your own words, what you are finding out
- find the important information
- look for the key phrases
- write what you know.
- look for a pattern
- guess and check
- write an equation
- break the problem down and solve each part.

Additional help...

- construct a model
- draw a picture
- make an organised list or table
- use objects to act out the problem
- use easier numbers
- work backwards.

Answering the problem...

- use all the important information
- check your work
- decide if the answer makes sense
- write the answer in a complete sentence.

Each class will incorporate problem solving into their plans to regularly tackle word problems as a class, teaching the steps involved.

Estimation will be included regularly in Maths lessons. Children will be encouraged to use each of the following strategies selecting the most appropriate for the task in hand:

- Front end- **Front-end estimation** is a particular way of **rounding** numbers

to **estimate** sums and differences. To use **front- end estimation**, add or subtract only the numbers in the greatest place value. Then add the decimals rounded to the nearest tenth.

- Clustering- **Cluster estimation** can be used to **estimate** sums and products when the numbers you are adding or multiplying **cluster** near or is close in value to a single number. Example# 1: **Estimate** $699 + 710 + 695 + 705 + 694 + 715$. Carefully examine all the numbers above. You should notice that they all **cluster** around 700.
- Rounding
- Special numbers/ friendly numbers/ number bonds/ friends of ten (i.e. numbers that add to make 10)

These strategies are explained in of the *Mathematics Curriculum, Teacher Guidelines*, pp 32-34.

2.7 Assessment and record keeping

Assessment is used by teachers to inform their planning, selection and management of learning activities so that they can make the best possible provision for meeting the varied mathematical needs of the children in our school.

Teachers select from the following range of assessment approaches:

- teacher observation of knowledge, skills development and participation in activities
- standardised tests, e.g. *Drumcondra Primary Mathematics Tests*
- teacher-designed tests and tasks, e.g. *Planet Maths end of unit tests & half term/ end of term assessments/ Work It Out/ Mental Maths Friday Tests/ assignments/ activities on Sum Dog/ other online platforms*
- work samples, portfolios and projects
- Self-assessment e.g. traffic lights, thumbs up/down, etc.
- Peer assessment
- Challenges during theme weeks such as Maths Week

3.7.1 Teacher observation

The curriculum refers to the validity of teacher observation as a means of building a broad understanding of a child's strengths. Teachers will note anything that they feel is important in relation to a child's progress in Maths. Observations may include the following

- the level of engagement in or attention to activities
- strengths and concerns in relation to written work
- involvement in discussions
- the response to and initiation of questioning during class or group work.

3.7.2 Standardised testing

The following procedure is used for norm-referenced tests:

- Children are formally assessed by means of the *Drumcondra Primary*

Mathematics Tests. SIGMA T may be used as an assessment tool at the beginning of the school year.

- All children will be tested in the final term of each academic year.
- The results of each child's tests and their test papers will be kept in their file and stored securely.
- Test results are communicated to parents at parent-teacher meetings and at regular intervals throughout the year when necessary. Results of standardised tests will be included in the child's end of year report.
- In line with the school's policy on record keeping, school files are maintained until the child reaches the age of 21.
- The SEN team will administer tests as necessary

3.7.3 Teacher-designed tests and tasks

The following are used throughout the school to inform the class teacher of each child's progress in Maths:

- oral tests (tables, continuation of number patterns, ...)
- written tests of understanding of topic *e.g. Planet Maths Assessment Tests.* Test results are kept by the class teacher in an assessment folder and may be passed to the next teacher.
- problem-solving exercises that use a variety of mathematical skills, e.g.

Brainteasers.

3.7.4 Work samples, portfolios and projects

Pupils will be involved in project work that requires compilation of data or the drawing of a diagram, etc e.g. shapes/ Maths around us, Olympic Games, etc.

3.7.5 Continuous self-assessment

Through teacher questioning and self-assessment, children will learn to take ownership of their learning. Teachers will take note of children's self-assessment to decide who receives additional support with a SEN teacher and who can be supported in class. Some self-assessment methods include

- The class shows thumbs up/ down/ halfway based on how they are finding a topic
- The class showing out of five fingers how they felt about the difficulty of a topic/ activity
The children drawing a green, orange or red face at the end of their written work to signify their understanding
- The children writing self-reflective sentences at the end of their maths work/ maths test e.g. one area I'm doing really well with in maths is...; one thing I'd like to improve is...; I'd like to improve this by.....
- The use of rubrics for problem solving/ procedures
- Talking to a partner at the beginning of a lesson about what they found tricky yesterday and what they want to focus on today

2.8 Children with special needs

The Maths programme aims to meet the needs of all children in the school. This is achieved by teachers varying the pace, content and methodologies of their programme to ensure learning for all children. Evidence of the differentiated approach will be

recorded in teachers' long-term planning. Those children who receive scores at or below the 16th percentile in standardised tests will attend the SET for supplementary teaching for Maths. This may also be done as in-class support, particularly in the younger classes. Arrangements will be in accordance with the recommended selection criteria as determined by the DES. Diagnostic tests may also be administered where the need arises. Parental permission must be obtained before these tests are administered.

For children who do not qualify for supplementary teaching yet demonstrate difficulty with Mathematical activities, the SET will liaise with the class teacher on resource books and materials that could be used by the class teacher and the child in the mainstream class setting. Children who attend the SET for other needs may receive help for maths during this time too. Additionally, some children may be catered for by in-class support from the SET e.g. maths stations.

The progress of such children will be reviewed on a regular basis. The requirements of children with special needs are taken into consideration when planning class lessons and field trips. Special Needs Assistants (SNAs) support particular children or groups as directed by the class teacher, SET and the principal. Additional materials and resources may also be purchased by the school.

For children who are gifted in Maths, teachers may provide the following opportunities

Differentiation: During maths activities the teacher will differentiate the work to provide more challenging opportunities for those who need it

Projects: Time to work on independent projects linked with maths

CTYI: A referral to *The Centre for Talented Youth* in DCU (for children with a STEN of 9 or 10)

Fast finisher challenges: children who finish written maths promptly and without challenges can then have a maths game/ challenging question/ maths challenge booklet to complete

NRICH.org- source of useful problem-solving challenges

Maths partners: pair more able children with children who need assistance so they can learn to explain topics

2.9 Equality of access and participation

All children are provided with equal access to all aspects of the Maths curriculum and encouraged to reach their full potential regardless of Special Educational Needs, background, etc.

2.10 Timetable

In accordance with the Primary Curriculum (1999), the following time is allocated for Mathematics in this school per week:

Infant classes:	3 hours 25 minutes
1 st Class-6 th Class:	4 hours 10 minutes

Timetables must reflect this time allocation for Maths. There is discretionary time available each week that can be used occasionally to support the Mathematics curriculum.

2.11 Homework

Homework is largely given for reinforcement and to widen experiences begun in the classroom. The curriculum states that homework should be realistic, practical, and relevant, and that alternate forms of homework assignments such as research or practical measuring

can be given. It is noted that parents may need to be made aware that maths homework will include practical work from time to time (e.g. measuring length of table/ bed, etc).

Homework allocated should take account of the differing levels of ability in the class. Children should generally be given a mixture of number work, the current concept being taught, and mental Maths in a homework assignment.

Time should be allocated as part of the Maths lesson or in the 'ag teacht le cheile' time in the mornings for correction of homework, and the review of any problems arising. 1st to 4th class should have tables to learn every night and these should be tested every day. There is an expectation that pupils know the multiplication tables by the end of 4th Class.

Sum Dog or other ICT Maths Platforms may be assigned in place of Maths homework once per week- this is at the discretion of the class teacher and may be used to assess or conclude a topic.

Timetabling of Maths homework:

Senior Infants	once a week
1 st -3 rd Class	every night
4 th -6 th Class	every night

2.12 Resources and ICT

The following resources are used in support of Maths curriculum implementation:

- textbooks and workbooks
- manipulatives
- calculators
- supplementary materials
- reference books.
- ICT Maths Platforms

Textbooks/workbooks

Textbooks are selected in line with the school's Textbook Policy and reflect the objectives of the curriculum. The schemes currently in use throughout the school include Planet Maths, Mathemagic and Mental Maths. These schemes are in line with the methodologies and language agreed by the staff in the core areas listed in this plan and are in line with the requirements of the Mathematics curriculum. Teachers should not use the text chosen for the next class level in the same scheme, as this may lead to difficulties in terms of continuity and progression in the following year.

Supplementary materials will be designed / supplied, as deemed necessary by each class teacher.

Manipulatives

We acknowledge the importance of concrete materials in the development of mathematical concepts for children in all classes. Each class should have Maths resources suitable for that level, and we aim towards equipment being shared between class pairs from 1st Class to 6th

2.15 Staff development

Teachers are made aware of any opportunities for further development through participation in courses available in Education Centres or other venues. Skills and expertise within the school are shared and developed through inputs at staff meetings. CPD sessions with external professionals are scheduled on regular basis and staff are encouraged to share feedback from CPD courses they attend.

The school subscribes to www.Twinkl.com where extensive maths resources are available.

2.16 Parental involvement and home/school links

Parents are encouraged to support the school's programme for Maths. The parent/class teacher meetings at the start of the year will provide the opportunity to make parents aware of the content of the Maths programme for that year. Parents will be made aware that homework assignments may sometimes be practical (e.g. measuring length of room) or involve research. The need to encourage learning of tables should be emphasised, along with using the correct mathematical language. Parents should also be made aware of how much they can help their child in encouraging use of number, estimation and mental strategies in everyday life. More in-depth explanation of methodologies (e.g. regrouping) can be explained on information sheets, sent home to parents.

2.17 Community links

Members of the local community may be invited to assist the school's Maths programme occasionally e.g. during Maths Week. Proposed invitations must be discussed in advance with the principal. Procedures for guest speakers must be followed including ensuring they are Garda vetted and wearing a visitor lanyard at all times.

3. Success criteria

The success of this plan will be measured using the following criteria:

- implementation of revisions in the Maths curriculum will be evident in teachers' work
- continuity of content and methodology will be evident in teachers' preparation and monthly progress reports
- on-going assessment, formal and informal, will show that pupils are acquiring an understanding of mathematical concepts, and a proficiency in maths skills appropriate to their age and ability.

4. Implementation - roles and responsibilities

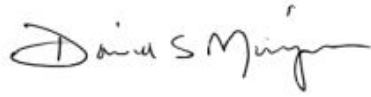
Class teachers are responsible for the implementation of the Maths programme for their own classes.

5. Review

Progress made during this school year will be reviewed in **October 2023**, based on results of standardised assessment tests and on teachers' views as to the effectiveness of the plan. The policy will be reviewed in detail in **2025**, in line with the implementation of the New Maths Curriculum.

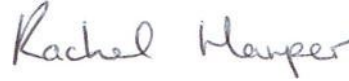
6. Ratification and communication

This plan was ratified by Board of Management in January 2023. The plan was communicated to teachers and made available on SharePoint and implemented with all classes and made available to parents through the school website.



Signed: _____

Canon D Mungavin
Chairperson
Board of Management



Signed: _____

R Harper
Principal

Date: 25th October 2024

Date: 16th October 2024