

St Mary's Junior School

Whole School Plan for Numeracy



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1. Introduction

St Mary's JNS is a junior co-educational school in the parish of Rowlagh, Clondalkin. St Mary's has been designated as a DEIS Band 1 school. There are currently 199 pupils enrolled at St. Mary's JNS. There are 11 Class Teachers, 4 Learning Support Teachers, 1 Behaviour Support Teacher, 2 ASD Teachers, a Home School Liaison Teacher and the Principal. There are also 9 Special Needs Assistants on the staff. The vast majority of our pupils come from the North Clondalkin area.

This Numeracy policy was drawn up during the 2021/2022 academic year. It is intended that the plan will provide a framework that promotes teaching and learning of numeracy throughout the school.

1.1 Ratification and Communication

This plan will be communicated to staff and parents and Board of Management in Term 2 of 2021/2022, prior to formal implementation.

Following ratification, it will be placed on the school website.

Hard copies of the plan will be made available to all teaching staff in Term 2 of 2021/2022.

This plan was ratified by the Board of Management on	
Signed:	Signed:
Board Of Management	Principal

1.2 Rationale

This plan is a record of whole school decisions regarding teaching and learning in relation to Mathematics which is in line with the Primary Curriculum, 1999. It is intended to:

- Enhance teaching and learning in our school.
 - Outline the philosophy of the school regarding Mathematics.
 - Put in place a structured approach regarding content, methodologies and language for the teaching of Mathematics in our school, in line with the Primary School Curriculum 1999.
 - Ensure continuity of teaching methodologies throughout the school.
 - Outline details on planning, resources and assessment.
 - Inform new or temporary teachers of the approaches used in our school.

1.3. Vision and Aims

- Vision

In line with the school's vision statement, we strive to facilitate each child in reaching their full potential in Mathematics. Children are presented with learning experiences that enable them to progress their mathematical understanding and skills at a level that is developmentally appropriate. We endeavour to provide Mathematics education that helps the children to use Mathematics in their everyday lives; to apply and problem-solve, to communicate and express, to integrate and connect and to reason mathematically.

- Aims

In light of this vision, our aims in Mathematics (in accordance with the aims for Mathematics in the Primary School Curriculum pp. 12-14) are as follows;

- To provide all children with the opportunity to access the full range (all strands and skills) of the Mathematics Curriculum
- To encourage a positive attitude towards Mathematics and an appreciation of both its practical and its aesthetic aspects, enabling the child and parents to see that Mathematics is fun and can be enjoyed.
- To enable the child to use mathematical language effectively and accurately
- To enable the child to acquire an understanding of mathematical concepts and processes to his/her appropriate level of development and ability
- To enable the child to acquire proficiency in fundamental mathematical skills and in recalling basic number facts
- To develop the ability to think clearly and logically
- To develop problem-solving abilities and a facility for the application of Mathematics to everyday life
- To provide pupils with a supportive atmosphere in which to develop their mathematical skills
- To allow all children the opportunity to succeed according to their individual ability.
- To increase the standard of Mathematics in the school.
- To integrate Mathematics into other curriculum areas.
- To ensure there is much emphasis on active learning strategies, including extensive use of concrete materials in all classes, along with using the school building and environment.
- To inform Mathematics teaching by on-going Assessment for Learning.

2. Content of Plan

2.1 Curricular Planning:

1. Strands and Strand Units:

Year Band	Junior and Senior infants	1 st and 2 nd Classes
<i>Strand:</i>	<i>Strand Units</i>	
Early Mathematical Activities	<ul style="list-style-type: none">- Classifying- Matching- Comparing- Ordering	
Number	<ul style="list-style-type: none">- Counting- Comparing and Ordering- Analysis of Number- Combining/ Partitioning- Numeration	<ul style="list-style-type: none">- Counting and Numeration- Comparing and Ordering- Place Value- Operations<ul style="list-style-type: none">o Additiono Subtraction- Fractions
Algebra	Extending Patterns	Extending and Using Patterns
Shape and Space	<ul style="list-style-type: none">- 3-D shapes- 2-D shapes- Spatial Awareness	<ul style="list-style-type: none">- 2-D shapes- 3-D shapes- Spatial Awareness- Symmetry- Angles
Measures	<ul style="list-style-type: none">- Length- Weight- Capacity- Time- Money	<ul style="list-style-type: none">- Length- Area- Weight- Capacity- Time- Money
Data	Recognising and Interpreting Data	Recognising and Interpreting Data

- Each class teacher familiarises themselves with the curriculum objectives for their own class level from the Teacher Guidelines.
- Each SEN teacher familiarises themselves with the curriculum objectives for the class level they are teaching.

2.2 Skills

Teachers make sure that mathematical skills are being actively developed through the content and applied to other subject areas (See Teacher Guidelines: Mathematics pp. 68-69)

Skill	Junior and Senior Infants	1 st and 2 nd Class - JI/SI skills along with the following:
Applying & Problem Solving e.g. selecting appropriate materials and processes in science	<ul style="list-style-type: none"> - Select appropriate materials and processes for mathematical tasks - Select and apply appropriate strategies to complete tasks or solve problems - Recognize solutions to problems 	<ul style="list-style-type: none"> - Apply concepts and processes in a variety of contexts
Communicating & Expressing e.g. discussing and explaining the processes used to map an area in geography	<ul style="list-style-type: none"> - Discuss and explain mathematical activities - Record the results of mathematical activities using diagrams, pictures & numbers - Discuss problems presented pictorially or orally 	<ul style="list-style-type: none"> - Listen to and discuss other children's mathematical descriptions and explanations - Discuss & record using diagrams, pictures & symbols
Integrating & Connecting e.g. recognising Mathematics in the environment	<ul style="list-style-type: none"> - Connect informally acquired mathematical ideas with formal mathematical ideas - Recognise Mathematics in the environment - Recognise the relationship between verbal, concrete, pictorial and symbolic modes of representing numbers - Carry out mathematical activities that involve other areas of the curriculum 	<ul style="list-style-type: none"> - Understand the mathematical ideas behind the procedures he/she uses
Reasoning e.g. exploring and investigating patterns and relationships in music	<ul style="list-style-type: none"> - Classify objects into logical categories - Recognise and create sensory patterns - Justify the processes and results of mathematical activities 	<ul style="list-style-type: none"> - Make guesses and carry out experiments to test them - Recognise and create mathematical patterns and relationships
Implementing e.g. using Mathematics as an everyday life skill	<ul style="list-style-type: none"> - Devise and use mental strategies/procedures for carrying out mathematical tasks - Use appropriate manipulatives to carry out tasks and procedures 	<ul style="list-style-type: none"> - Execute standard procedures efficiently
Understanding & Recalling	<ul style="list-style-type: none"> - Understand and recall terminology 	<ul style="list-style-type: none"> - • Understand and recall terminology and facts

2.3 General Approaches to Mathematics

All children should be provided with the opportunity to access the full range i.e., all strands, of the Mathematics curriculum. In our school we ensure this happens as follows:

- The content to be taught to each class shall follow that of the Revised Mathematics Curriculum.
- Maths work will be differentiated by the class teacher and learning support teacher in a variety of ways e.g. groupings based on ability, differentiated teacher-designed worksheets, differentiated oral Maths questions, simplification of Maths language for children with literacy difficulties, etc.
- There is more emphasis on teaching the curriculum through active learning strategies and less emphasis and reliance on textbooks and workbooks.
- There is a hands-on approach to encourage children to explore, manipulate and understand Mathematical concepts, using broad, creative and varied concrete materials/everyday objects.
- Pupils should experience working alone, in pairs and in small groups.
- To facilitate varied learning styles, it is important that concepts/tasks are presented and explored in a variety of ways using pupils' own experience and environment as much as possible.
- Recording is done verbally, pictorially and in written form on whiteboards, worksheets and copybooks.
- Teachers ensure that the relevant mathematical language is implemented appropriately and in context formally through Maths instruction and informally across the curriculum eg Aistear
- Children are exposed to a Maths rich environment both within the classroom and in the wider school environment
- All teachers integrate mathematical skills across all areas of the curriculum where appropriate and useful eg numeracy activities in Aistear, time in SESE, gathering data in SESE, Shape and Space with PE and Visual Arts, measuring temperatures in Science, sorting and classifying in oral language and Science.
- Opportunities for linkage are used where appropriate e.g. teaching of decimals and money (TG pp. 52 & 56).
- We endeavour to ensure that:
 - The number limits are being adhered to, particularly at first and second classes where the emphasis is on the development of the concept of place value, e.g. more work within the hundred square without going past 100. For further information, refer to TG p. 70. Occasionally, the parameters may vary, depending on individual children.
 - All efforts are made that the children would 'discover' formulae rather than being taught by rote, e.g. length by breadth. It is, however, recognised that rote learning may occasionally be required to support this. Simple fraction families will be emphasised in the senior classes.
- We endeavour to raise the profile of Mathematics as a subject to be enjoyed by all children by using the environment and making Mathematics a practical, child-centred subject e.g. Mystery Maths time, display of Mathematics work in school, celebrating Maths Week annually (This happens in October every year), Maths party bags for use for homework, Maths trails. Active Maths (e.g. board games/cards/ICT).
- Maths displays will be created in classrooms and around the school.

2.4 Methodologies

All Mathematics teaching in the school is guided by the following underlying principles of teaching and general approaches. Further information is available in the appendices.

Active Learning & Guided Discovery	<ul style="list-style-type: none">- Children work actively in individual and collaborative settings.- Textbooks are used sparingly, as a resource only.- The teacher serves to elicit, support and extend children's prior and new learning.- Conceptual understanding takes precedence over rote use of procedures.
Multiple Representations	<ul style="list-style-type: none">- All concepts, at every class level, will be introduced with the use of concrete materials.- These will be followed by the use of appropriate pictorial materials.- Children will use abstract representations following success in their use of concrete/pictorial materials.
Mathematical Language, Talk and Discussion	<ul style="list-style-type: none">- Mathematical language will be modelled through explicit teaching.- Children will be given opportunity to use mathematical language in a variety of classroom configurations and settings (e.g. pair work).- Due attention will be given to the skill of communicating and expressing.
Skills through Content	<ul style="list-style-type: none">- The skills of the curriculum are given due attention in teacher preparation and planning.- Skills can be explicitly modelled in isolation, but their application will be embedded in teaching.

2.5 Maths-Rich Environment

Mathematics and numeracy provide a lens with which to view the world. Accordingly, children need every opportunity to apply their mathematical knowledge to their environment, and to use their environment to further their mathematical knowledge.

The following approaches are used in the school to foster this reciprocal link:

- Maths noticeboard on general display
- Maths displays in every classroom
- Display of children's works
- Frequent informal Maths trails (to find shapes, measure)
- More formal Maths trails (e.g. Maths Week)
- Informal and formal reference to the Maths Eyes approach

2.6 Skills Development

Teachers include the skills of the Mathematics Curriculum in all lessons.

The skills through content approach is adopted; this means that children will develop their skills while working on a particular content area of the curriculum. For example, children may reason how to categorise shapes while completing activities in the shape and space strand. They may then explain their reasoning to their group, developing their communicating and expressing skills.

2.6.1. Applying and Problem Solving

Problem solving is used as an approach to teaching at all possible opportunities.

It is recognised that, that children in our school benefit from a structured approach to written word problems. The RUDE Approach is used across the school for problem solving in this context:

1. Read the problem
2. Underline important words
3. Draw a picture
4. Estimate an answer

Teachers are not limited to using this approach for other types of problems.

Each of the types of problems represented in the primary school curriculum should be taught throughout the course of the year at each class level. The frequency for each problem below is a minimum guideline, and should, in most cases, be exceeded. In Junior and Senior Infants, the frequencies may vary.

Type of Problem	Frequency	Guidance/ Examples
Word Problems	Weekly	<ul style="list-style-type: none">• Written problems provided by the teacher• Problems generated and written by children for other children to solve• Problems from textbooks
Practical Tasks	Weekly	<ul style="list-style-type: none">• Using concrete materials to find the answer to problems• Problems involving measurement in the school/classroom/home
Open-Ended Investigation	At least once termly	<ul style="list-style-type: none">• Problems that have more than one answer• Samples from www.nrich.maths.org
Puzzles	As appropriate for topic	<ul style="list-style-type: none">• Tangrams to make pictures (shape and space)• Pattern solving (algebra)• Mathematical riddles
Games	As appropriate for topic	<ul style="list-style-type: none">• Place value games eg Mata sa Rang• Feely bag games (shape and space)
Projects	At least once a year	<ul style="list-style-type: none">• E.g., planning/buying food for a party using prices from an online shopping website
Mathematical Trails	Informally at every opportunity. Formally twice a year	<ul style="list-style-type: none">• Maths week trails• Maths scavenger hunts• Walks to find shapes, angles, lines in the environment

2.6.2. Communicating and Expressing

The instructional framework for teaching Mathematics is endorsed (c.f. Appendix F). The skill of communicating and expressing can be developed by:

- Explicitly modelling and teaching mathematical vocabulary and sentence structures
- Providing regular opportunities for children to work in pairs and groups
- Asking children to explain and justify their answer
- Eliciting many solution methods for one problem/question

- Creating a safe environment for mathematical thinking; valuing effort and not emphasising errors
- Using pupils' explanations for lesson's content
- Probing children's answers and encouraging them to elaborate
- Allowing children to communicate their responses in a variety of ways, using concretes, orally, pictorially, in writing, videos.

2.6.3. Integrating and Connecting

Teachers include curriculum integration and linkage in their plans (see section 5.1 of this plan). Teachers promote integrating and connecting by:

- Emphasising the connections between operations, e.g. multiplication is repeated addition, or the inverse of division
- Consolidating work in the number strand through work in other strands (e.g. adding money using the formal algorithm).
- Incorporating numeracy in other subject areas, e.g. measurement in science, counting time and duration in music, writing capacities/weight in procedures, use of number or other mathematical concepts in Aistear.
- Capitalising on incidental references to numeracy during the teaching day, e.g. pointing out parallel lines in the PE hall, counting books in twos.

2.6.4. Reasoning

Children should be enabled, through active learning and guided discovery, to reason mathematically. In this way, teachers in St Mary's JNS can scaffold children in forming new mathematical knowledge. Teachers will help promote mathematical reasoning by:

- Giving children the opportunity to deduce and induce approaches to Mathematics, before directly teaching the strategy.
- Discussing problems and topics using probing questions to foster reasoning.
- Asking children to explain how they got an answer, and prompting them to fully explain their reasoning.
- Transferring known content to new contexts.

2.6.5. Implementing, Understanding and Recalling

The ability to draw on appropriate and accurate mathematical procedures and content knowledge is recognised in the school. In particular it is recognised that some children with Special Educational Needs may need to rely on known procedures to work mathematically, but not at the expense of conceptual understanding.

2.7 Presentation of Work

Careful presentation is acknowledged as an important feature of accurate and precise mathematical work.

2.7.1. Numeral formation

Children should be able to recognise numerals presented and written in a variety of forms. However, in order to achieve consistency within and across the different learning settings, a unified approach to the teaching of numeral formation is used in the infant classes. The following numeral formation is taught, starting on the highlighted points:

Note that:

- One is a straight line. There is no additional line on the top or bottom.
- Four is not enclosed.
- The first downwards stroke is vertical, not slanted.
- Five is written by making a downward stroke, followed by a loop, and then marking the top horizontal line.
- The number 7 does not have a line across it.
- Eight is written by 'starting like an s'.

See Appendix E for rhymes to accompany the teaching of these numerals.

2.7.2. Copy Work

Children begin using squared Maths copies in Junior Infants. The frequency with which these copies are used will increase as children progress through class levels. As a general rule, work in Maths copies should be presented as follows:

- Ruled – 'in two squares and down two squares'
- Dated – the date written at the top of the page
- Titled and numbered – exercise should be numbered in the ruled column
- One numeral/number per square
- The page may be split down the middle to fit more work on the page

2.7.3. Other Modes of Presentation

Copy books and textbook represent only two ways in which children's work and progress can be displayed. Other modes of presentation that are actively encouraged include:

- Charts and posters for project work
- Photographing work using school iPads/ Cameras
- Presenting work using technology (e.g. presentations, videos)
- Use of whiteboards for skills practice
- Oral presentations
- Using playdough, rice, sand and other concrete materials to form numerals

2.8. Homework

Homework in Mathematics serves three main purposes in St Mary's JNS :

1. Consolidate work learned in school
2. Facilitate learning of mathematical facts
3. Foster home-school connections and extend Maths knowledge beyond the classroom

Therefore, the homework set for each child should be at his/her level and differentiated accordingly. This differentiation may take the form of different work or reduced amounts of work.

Bearing the three purposes above in mind, the type of homework set in Maths each year is agreed at a class-level by teachers.

Mental or Oral Maths homework is considered to be of equal or greater importance to written work. This includes the memorisation of tables.

Children are encouraged to explain their Maths homework to their parents, in order to share the mathematical language with which they are familiar.

3. Children with Different Needs

3.1 Model of Support Teaching for Mathematics

3.2. In-class differentiation: -

A combination of approaches for differentiation are employed in all classes, based on the needs of learners:

By Process	By Product	By Content
<ul style="list-style-type: none">•Extended use of concrete materials.•Extended use of pictorial representations.•Variety of mixed and ability groups.•One to one or small group support.•Different mathematical strategies may be emphasised.	<ul style="list-style-type: none">•Different amount of work to complete.•Different mode of presentation (E.g. Number sentence v. Picture)•Partial completion	<ul style="list-style-type: none">•Mathematical content at a different class level, within the same strand unit (where warranted)•Mathematical content at a different difficulty level, or different level of complexity, within the same strand unit.•Different skills emphasis (e.g. Implementing versus problem solving)

4. Assessment and Record Keeping

4.1. Self-Assessment

Teachers decide these strategies at their own discretion. Some recommended approaches include:

- Mathematical scrapbooks, journals and dictionaries
- Thumbs up / Thumbs down
- Two stars and a wish
- Traffic lights
- Conferencing

4.2. Teacher Designed Tasks and Tests

Teacher designed tasks and tests are used for assessment for and of learning. These tests help to identify areas that require attention in upcoming weeks and terms.

A teacher designed test is carried out at each class level at least once termly (usually towards the end of the term). These tests are sent home for parents to view and sign, before being returned to the teacher.

Teachers have discretion in designing these assessments at class level. Assessments drawn from Maths schemes (e.g. Busy at Maths) are appropriate.

Teachers may use their own discretion to assess more regularly, for example at the end of a particular topic. Teachers typically test tables on a weekly basis, though this is not obligatory. Children's strengths and weaknesses in Mathematics are outlined to parents formally at parent-teacher meetings (second half of Term 1) and in summer written reports (May/June). Difficulties that a child may be having are given particular attention.

4.3. Standardised Tests

Standardised tests take place annually from senior infants upwards. These take place in May each year and are administered by the SET Team.

Drumcondra Test are used, by the school, in Senior Infants and SIGMA-T in First and Second class, developed by the CDU in Mary Immaculate College. Standardised assessment information is shared with parents on the annual report cards in the month of June. They are informed of regular formative assessment at parent-teacher meetings and/or informal meetings where necessary.

Results are communicated to parents via the school report in the month of June. When necessary, a face-to-face meeting may be arranged after the report has issued.

Results are also used to inform planning and interventions for Maths where needed.

4.4. Ready, Set, Go, Maths Assessments & Number Worlds

The significant goals outlined in the RSGM manuals are given particular attention in Junior and Senior infants.

Teachers monitor children's attainment of these goals on an ongoing basis. This may involve working with one child during small group work (during in-class support time), and working with a different child on a different day.

Particular attention is given to children's development of one to one correspondence and conservation of number in Junior Infants. Children who are having difficulty with these concepts are prioritised for remediation as soon as possible; remediation is not left until later in the year.

4.5.Record Keeping

The following records are kept on mathematical progress:

- Information as it relates to specific diagnoses and Maths difficulties are noted in children's Individual Pupil Learning Profiles.
- RSGM Assessments should be passed from Junior Infants to Senior Infants, and onwards to First Class.
- SIGMA-T results are kept on each child's Aladdin profile; SIGMA-T response booklets are kept in each child's physical file held in the office.
- Teachers keep a record of any teacher designed tests run during the year in their assessment folder.
- Teachers keep a record of tables test results in their assessment folder.
- Incidental notes and observations on a child's mathematical development may be recorded in pupil profiles (e.g. learning support profiles passed to new teachers).

5. Planning and Preparation

The planning for teaching and learning in Mathematics is informed by the following, in order:

1. The needs of the children in the class
2. This school plan and other pertinent plans (e.g. School Improvement Plan)
3. The Primary School Curriculum for the class level
4. Programmes being implemented in the school; e.g. Ready, Set, Go, Maths
5. The consolidation activities available in textbooks; e.g. Busy at Maths

5.1. Planning Format

5.1.1. Long-term planning Long-term plans for Mathematics, completed termly, will contain the following specific sections, appropriate for the particular class:

Aims	Breakdown of curriculum content: Strands, strand units, objectives	Mathematical language	Focus of skills development	Linkage and integration
Teaching methodologies and approaches	Differentiation	Assessment	Resources	

5.1.2. Short-term planning Short-term plans for Mathematics, completed weekly (for probationary teachers) or fortnightly, will contain the following specific sections, appropriate for the particular class and the work being completed in a particular week/fortnight:

Strand (s) and strand unit (s)	Objectives	Skills	Mathematical language	Activities and methodologies
Resources	Differentiation	Assessment	Integration and linkage	

5.2. Timetabling

All classes will comply with the minimum times for Mathematics set out in Circular 56/2011. We have dedicated Numeracy time : 10.45 – 11.35

That is;

- Infants: 3 hours 25 minutes per week / 41 minutes daily
- First- Second Class: 4 hours 10 minutes per week / 50 minutes daily.

In most cases, these time allocations will be exceeded. The school has agreed (in 2012) that, pending renewed time allocations from the NCCA, extra time for Mathematics will be drawn from integrated teaching, discretionary time and a reduction in time for Arts/SESE subjects.

5.3. Reporting The Cúntas Míósúil will be used to record progress in Mathematics. The content, including objectives covered, will be detailed by each teacher, as it applies to their particular class.

Given the centrality of Mathematics and numeracy to the curriculum, it is expected that professional reflection on progress in Mathematics will be included in the appropriate section of the agreed Cúntas Míósúil format.

6. Resources

Teaching Mathematics developmentally requires a range of materials, including those that are purchased, school-made, or those that are readily available in the everyday classroom.

- A core stock of counters, dice and cubes are available in every classroom.
- Ready, Set, Go, Maths trollies have been prepared with all of the requisite materials required for both junior and senior infants.
- All resources available in the staff resource room are used communally. They are deployed using a sign in / sign out system.
- Electronic resources will be made available on the shared drive/shared storage.
- Internet resources accompany some of the programmes in use in the school (Busy at Maths)
- Textbooks are available as a resource at each class level (Busy at Maths is the core textbook).

Teachers take shared responsibility in maintaining Maths equipment. New Maths equipment is ordered by Assistant Principal A, after consultation on spending priorities with teachers. Given the developing nature of the school, Mathematics equipment is purchased on an ongoing basis. Updated inventories will be placed in the staff resource room, and will be made available electronically.

7. Technology

Technology plays an increasingly important role in real-life Mathematics. A variety of technology resources are available for teaching Maths in the school, including:

- iPads – a variety of apps for different skills are available
- PCs/Laptop Computers (in some classrooms)
- Interactive Whiteboards
- Cameras
- Visualisers

Teachers are encouraged to use technology appropriately to enhance children's learning. This includes:

- Modelling the use of concrete materials under the visualiser
- Using iPad apps for drill and practice (tables, practising telling the time)
- IXL programme is used in some class levels
- Playing online games on the IWB
- Using the iPad camera app/ cameras for Maths trails, recording work
- Practising numeral formation using drawing apps
- Deploying iPads in stations

8. Staff Development

A range of reference materials for Mathematics are available in the staff resource room, including:

- Teaching guides (e.g. PDST Handbooks)
- Academic Texts (e.g. Teaching Number in the Classroom with 4-8 Year Olds)
- A variety of Mathematics schemes: resource books and textbooks

All professional development notifications and literature that are received by the school, as they relate to Mathematics, are relayed to staff Assistant Principal A. This notification will take the form of staff announcements on Aladdin, postings on the CPD noticeboard, and notices on the staff notice whiteboard in the staff room.

The school has a teacher trained in Maths Recovery working with children and teachers on this programme.

The school provides funding for professional development that supports the roll-out of specific programmes. This includes training in programmes like Mata sa Rang. Given the limited funding available, this training will be targeted at teachers who are directly involved in the class-level that would most benefit from the professional development.

Time is made available at staff meetings to:

- Facilitate professional development from outside agencies (e.g. PDST, SESS)
- Promote the sharing of professional learning internally
- Discuss progress in Mathematics (as it relates to this plan, SSE)

9. Parent and Community Links

Given our community focus, parents play an important role in the development of Mathematics in the school.

Parent information sessions are held with each class level annually, in September, during which parents are informed of the new Mathematics content and approaches their children will learn during the year.

Information about Mathematics in the school is also made available on the school website, www.stmarysjunior.ie

Parents are encouraged to take an active role in their children's mathematical development through:

- Attending class information at the start of the year
- Attending parent/teacher meetings
- Helping their children with homework
- Helping out in classrooms when teachers seek volunteers
- Talking to their children about Maths that they see in the environment
- Fostering a positive attitude towards Maths

10. Implementation and Review

10.1. Roles and responsibilities:

The plan will be implemented by all members of the teaching staff. The principal will play a role in overseeing its implementation. Guidance on particular aspects of the plan can be sought from Assistant Principal 1.

10.2. Timeframe

The plan will be reviewed formally after one year, in May/June 2023, in line with DEIS planning in Mathematics. In addition, it will require specific review in light of changes to the Mathematics Curriculum for (Junior Infants – Second Class)

11. Appendix A: Mathematical Language

11.1. Vocabulary for Core Operations

The following vocabulary is introduced at each class level. The language taught in previous class levels is maintained. Note that the term number sentences or number stories is used to describe mathematical operations. The term sum refers to addition only. All language will be explicitly modelled and used orally/aurally before progressing to written form (in First class on).

	Junior infants	Senior infants	1 st class	2 nd class
Equals =	Altogether makes Makes (The formal equals sign is not introduced in JI)	Is the same as Equals =		
Addition	---- and ---- Altogether makes More (than) Combine Partition Add (for teacher use)	--- and/ add/plus— is the same as --- and/ add/plus— equals Count on +	Addition Plus Add And	Sum
Subtraction	Informal use by the teacher (eg how many are left?)	---take away--- leaves---subtract— leaves Formal sign not introduced	Subtraction Subtract Minus Less Difference -	More than

11.2. Language and Presentation of Formal Algorithms in the Operations : The teaching of these procedures only follows extensive work with concrete materials and opportunities for the use of informal/child-invented strategies.

	<p>11.2.1. Addition without renaming I am adding eighty two plus fifteen. <i>I will start with the units.</i> Two plus five is seven. <i>I will write the seven under the units.</i> <i>Then I will add the tens.</i> Eight tens plus one ten is nine tens. <i>I will write nine under the tens.</i> So eighty two plus fifteen is ninety seven.</p> <p><i>After practice and repetition, the text in italics may be omitted for the sake of efficiency.</i></p>
	<p>11.2.2. Addition with renaming I am adding forty five plus thirty six. <i>I will start with the units.</i> Five plus six is eleven. I cannot write eleven under the units, so I will put down one unit, and carry the one ten. <i>Then I will add the tens.</i> Four tens plus three tens is seven tens, plus one more ten is eight tens. <i>I will write eight under the tens.</i> So forty five plus thirty six is seventy one.</p> <p><i>After practice and repetition, the text in italics may be omitted for the sake of efficiency.</i></p>
	<p>11.2.3. Subtraction without renaming I am subtracting sixteen from seventy eighty. [Check if the number on the bottom is lesser in value] <i>I will start with the units.</i> Eight take away six leaves two. <i>I will write two under the units.</i> <i>Then I will subtract the tens.</i> Seven tens take away one ten leaves six tens. <i>I will write six under the tens.</i> So seventy eight subtract sixteen is sixty two. <i>After practice and repetition, the text in italics may be omitted for the sake of efficiency.</i></p>
	<p>11.2.4. Subtraction with renaming I am subtracting eighteen from thirty five. [Check if the number on the bottom is lesser in value] <i>I will start with the units.</i> I cannot subtract eight from five. I exchange a ten to make ten units. I cross out three, and that leaves two tens. When I bring that ten over into the units, I have fifteen. Fifteen take away eight is seven. <i>I will write seven under the units.</i> <i>Then I will subtract the tens.</i> Two tens take away one ten leaves one ten. <i>I will write one under the tens.</i> So thirty five take away eighteen is seventeen. <i>After practice and repetition, the text in italics may be omitted for the sake of efficiency.</i></p>

11.3. Maths language for other strands:

All language will be explicitly modelled and used orally/aurally before progressing to written form (in First class on).

11.3.1. Junior Infants

Due attention is given to the mathematical phrases and vocabulary outlined in Ready, Set, Go Maths, as well as the following.

Early Mathematical Activities				
Classifying	Matching	Comparing	Ordering	
Colours Big Bigger Biggest Long/tall Longer/taller Wide/ wider / widest Heavy / heavier / heaviest Is the same as/ is not the same as I like.... / I don't like Rough Small / smaller/ smallest Short / shorter / shortest Narrow / narrower / narrowest Light /lighter / lightest Different to Things that are/ things that are not ...	More than Enough As many as Than (e.g. longer than....)	First Next Before Start Last After Finish	
Number				
Counting	Comparing and ordering	Analysis of number		
One (1) Two (2) Three (3) Four (4) Five (5) Six (6) Seven (7) Eight (8) Nine (9) Ten (10) None Number Count How many? Count up to....	More than Same as First Too many Enough Less than/ fewer than As many as Last Not enough About the same as	___ and ___ altogether makes ___ and ___ makes ___ Zero (0) Left Add		
Shape and space				
Spatial awareness	3D shapes	2D shapes		
OverUp On In Straight lines Under Down Beside Outside Moving in... Curved lines	Roll/do not roll Corner Fit together/do not fit together Stack(ed)	Square Triangle Round Thick Shape Circle Rectangle Not round Thin Corner		
Measures				
Length	Weight	Capacity	Time	Money
Long Longer than Tall Wide Wider than Short Shorter than Taller than Narrow Narrower than	Heavy Heavier Balance Light Lighter Weigh	Full Empty Holds less than Nearly full Holds more than Holds as much as	Morning Evening Night Day Lunchtime Dinnertime Bedtime Early Late Monday Tuesday Wednesday Thursday Friday	Cent 1c 2c 5c Buy Sell Spend Coins How much?

			Saturday Sunday	
Data				
Recognising and interpreting data				
Sort Enough More than Less than As many as				

11.3.2. Senior Infants Due attention is given to the mathematical phrases and vocabulary outlined in Ready, Set, Go Maths, as well as the following.

Number				
Counting	Comparing and ordering	Analysis of number	Operations	
Zero-twenty	Second Third How many more?	Number line/strip Count back____ from____ leaves____ take away	____ plus ____ is the same as ____ plus ____ equals count on +	
Shape and space				
Spatial awareness	3D shapes	2D shapes		
Above Near Far Right Below Left Through Behind Stop	Cube Cuboid Sphere Cylinder EdgeCorner Straight Curved Round Flat Roll Face	Straight Curved Smaller Flat Side larger		
Measures				
Length	Weight	Capacity	Time	Money
As long as As wide as As high as High Higher Longest Shortest Highest Guess Measure Length Height Width	Weight Size Shape Balance Order Check Guess	Capacity Containers Fill Amount Compare Guess Check Record Results	Time Yesterday Tomorrow Today Week Day O'clock Birthday Seasons Soon Net yet Festivals (Christmas, Back to school...) Holidays Day	Cent (1- 20) Change Cost Price Cheap Expensive Too much Too little Sell amount
Data				
Recognising and interpreting data				
Groups Criteria Criterion With/without Choose				

11.3.3. First Class

Number				
Counting and numeration	Comparing and ordering	Place value	Fractions	Operations
Re-count Number 0-99 Numeral Set Count on Count back Number line Hundred square Guess Estimate Compare Less than More than About the same as	How many First – tenth Patterns	Tens Units Value Greater Lower	Half Whole Set	Addition Number Number sentence Number line Hundred square Count on Count back Counting in twos/threes... Doubles Near double Pair Number stories Renaming Guess Estimate Check Notation board Left How many do I need Fewer Subtraction Difference Symbols The same as Equals Number balance
Alegbra				
Extending and using patterns				
Odd Even Record Count in				
Shape and space				
Spatial awareness	2D shapes	3D shapes		
Between Underneath On top of Around Closed shape Open shape Shape Directions	Semicircle Size Curved/not curved 2-D Number Length Side	3-D Slide Vertices/ Vertex		
Measures				
Length	Weight	Capacity	Time	Money
Length Width Height Guess Compare Measure Record Widest Metre Nearly a metre A bit more than 1m A bit less than 1m Standard units Same length as	Guess Compare Measure Record Heaviest Lightest Standard units Kilogram Same weight as... Largest Smallest	Measure Pour Litre (l) Holds the same amount as... Measure Standard unit	Months of the year Day before Day after Time Calendar Half past Clock face Clock hands Later Earlierv	1c – 50c Equal value
Data				
Representing and interpreting data				
Pictograms Classify How many more? How many less?				

11.3.4. Second Class

Number				
Counting and numeration	Comparing and ordering	Place value	Fractions	Operations
0-199 Between Before After	Greater than, > Less than, < Ordinal number on the calendar Equal to =	Hundreds	Quarter	Sum More than
Algebra				
Count on Count back Number patterns Group(s) Shape and				
Shape and space				
Spatial awareness	2D shapes	3D shapes	Symmetry	Angles
Full Turn Half turn Quarter turn Forward Backwards	Oval Differences Two dimensional Half Quarter	Cone	Line symmetry Symmetrical Mirror image	Turn Corners Square corners
Measure				
Length	Area	Weight	Capacity	Time
Centimetre Trundle Wheel Tallest Shortest	Cover Space	Half kilogram Quarter kilogram	Half-litre Quarter litre	Quarter past Quarter to Date
Data				
Representing and interpreting data				
Table Chart Block Graph				

12. Appendix B: Tables and Number Facts Tables will be introduced as follows. Skills/exercise books relating to tables must also follow this plan.

Class	Junior infants			Senior infants			1 st class			2 nd class		
Term	T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
Addition +		Introduce number bonds to 5	Number bonds of 5 learned	Revise	Introduce number bonds to 10	Number bonds to 10 learned	Addition tables 1-10 Number bonds 0-20		Revision	Revision		Revision
Subtraction -								Subtraction tables 1-10	Revisions		Revision	Revision
									Skip counting 1,2,5, 10			Skip counting 1,2,3,4, 5,10

Language of tables (this should be varied, but if a standard form is desired, teachers may use the following)

- Addition: $5 + 2 = 7$ will be read as ‘Five and two is seven’
- Subtraction: $8 - 3 = 5$ will be read as ‘Eight take away three is five’

13. Appendix C: Teaching Content, Approaches and Sequence

The information outlined gives a broad provision of what will be completed at each class level, and how it will be approached.

13.1. Junior Infants

All work at this level is rooted in concrete materials with accompanying mathematical discussion. Conceptual and language development is key.

The Ready, Set, Go Maths programme will be used to teach Early Mathematical Activities and the Number strand, as well as aspects of other strands (E.g. sorting objects by length). Ready, Set, Go Maths will be used a minimum of three times a week.

Please refer to the programme for detailed guides on the language and practices to be used. Specifically, Junior Infants will complete all activities from the following sections of the Ready, Set, Go Maths programme:

Sorting	Relationships and operations	Counting and recognition	Understanding number
<p>1. Towards the Notion of a Set</p> <p>a. Random collections</p> <p>b. One property collections</p> <p>c. Two property collections</p> <p>d. Three property collections</p> <p>2. Using pictorial representations:</p> <p>a. Carroll and Tree diagrams</p> <p>b. Reasoning activities</p> <p>3. The Notion of Subsets</p> <p>a. Using logic people*</p> <p>*A variation of the logic people used in the RSGM manual will be used.</p>	<p>1. Making patterns</p> <p>a. Copying patterns</p> <p>b. Continuing patterns</p> <p>c. Devising patterns</p> <p>2. Relationships - Comparing Sets</p> <p>a. Compare unequal sets</p> <p>b. Compare equal sets</p> <p>c. Compare sets using more/less language</p> <p>3. Compare quantities within 5</p> <p>4. Partitioning sets within 5</p> <p>a. Subsets within 5</p> <p>b. Calculate mentally within 5</p> <p>5. Addition within 5</p> <p>a. Add two numbers practically</p> <p>6. Introducing the commutative property</p> <p>Note that formal symbols are not introduced in Junior Infants.</p>	<p>1. Counting activities</p> <p>a. Rhythm counting</p> <p>b. Pendulum counting</p> <p>c. Class number line</p> <p>d. Class picture line</p> <p>e. Bead line</p> <p>f. Individual number track</p> <p>g. Individual number cards</p> <p>h. Individual blank track</p> <p>2. Counting forwards from 1</p> <p>3. Counting forwards and backwards</p> <p>4. Recognising numerals</p> <p>5. Recognising and ordering numbers</p> <p>6. Counting quantities</p> <p>7. Counting forwards from different starts</p> <p>8. Number after</p> <p>9. Counting backwards from different starts</p> <p>10. Number before Note that the counting above</p>	<p>1. Developing one to one correspondence</p> <p>2. Towards knowing the numbers up to five</p> <p>a. Understand that the final number in the count refers to the whole set</p> <p>b. Cardinality within five</p> <p>c. Understand first, second, last, after before</p> <p>d. Order numbers to five, compare quantities within five</p> <p>e. Conservation of number within five</p> <p>3. Towards knowing the numbers up to 10</p> <p>a. Understand cardinality within 10</p> <p>b. Order numbers to 10, compare quantities within 10</p> <p>c. Conservation of number within 10</p>

		is within five initially, then ten.	
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The following broad outline of works is strongly recommended, as per sample plans developed at Junior Infant level and PDST recommendations (see

<http://www.pdst.ie/sites/default/files/RSGM%20Jnr%20Inf%20Scheme.pdf>)

Term 1	Term 2	Term 3
1) Early Mathematical Activities/ Data a) Sorting for one property collections: colour, shape, size, thickness b) Sorting two property collections c) Sorting three property collections d) Sorting two and three property collections 2) Number a) Counting 1-5 b) Components of the number 5 (partitioning) c) Compare sets: more/less 3) Shape and Space a) 2D shapes 4) Measures a) Length b) Time	1) Algebra a) Identify, copy, extend patterns in colour shape and size 2) Early Mathematical Activities a) Comparing sets without counting b) Counting c) Matching d) Ordering 3) Number a) Conservation of number to five b) Analysis of number: Combining and partitioning to five c) Ordinal numbers 4) Measures a) Weight b) Capacity c) Money	1) Number a) Analysis of number: Combining, partitioning b) Numeration: read, write, order numerals to five c) Calculate mentally within 5 d) Oral problems within 5 2) Data 3) Shape and space a) Spatial Awareness b) 3D Shapes Revision and assessment

13.2. Senior Infants

General Approach: Almost all work at this level is rooted in concrete materials with accompanying mathematical discussion. An introduction to formal symbols will take place in the second and third terms. Conceptual and language development is key.

Ready, Set, Go Maths will be used at least three times a week to teach the number and algebra strand. Other topics will be taught on the remaining days. Please refer to the RSGM programme for detailed guides on the language and practices to be used. Specifically, Senior Infants will complete all activities from the following sections of the Ready, Set, Go Maths programme. Revision of some Junior Infant concepts and activities will be necessary.

Sorting	Relationships	Counting and recognition	Understanding number
1. Towards the Notion of a Set (Revision) <ul style="list-style-type: none"> a. One property collections b. Two property collections c. Three property collections 2. Using pictorial representations: <ul style="list-style-type: none"> a. Venn diagrams b. Reasoning activities 3. The Notion of Subsets a. Using logic people <ul style="list-style-type: none"> o Venn Diagrams o Tree diagrams o Carroll diagrams o Games for logic people 4. Sorting activities using logic blocks <ul style="list-style-type: none"> a. Venn diagram b. Games using logic blocks 	1. Making patterns (Revision) <ul style="list-style-type: none"> a. Copying patterns b. Continuing patterns c. Devising patterns 2. Relationships - Comparing Sets <ul style="list-style-type: none"> a. Compare sets using more/less language 3. Compare quantities within 10 4. Partitioning sets within 10 5. Addition within 10 6. Introducing the commutative property 7. Subtraction within 10 8. Towards mental confidence 9. Using Cuisenaire to consolidate learning within 10. Children will be introduced to formal symbols for addition and the equals sign in Term 2. The equals sign will be paired with the following language: 'is the same as' and 'equals', not altogether makes. Children will not be introduced to formal symbols for	1. Counting activities <ul style="list-style-type: none"> a. Rhythm counting b. Pendulum counting c. Class number line d. Class picture line e. Bead line f. Individual number track g. Individual number cards h. Individual blank track 2. Counting forwards from 1 3. Counting forwards and backwards 4. Recognising numerals 5. Recognising and ordering numbers 6. Counting quantities 7. Counting forwards from different starts 8. Number after 9. Counting backwards from different starts 10. Number before Note that counting is done to ten initially, for revision. It then continues to 15, and 20.	1. Developing one to one correspondence (revision as required) 2. Towards knowing the numbers up to 15 (20) <ul style="list-style-type: none"> a. Understand cardinality within 15 (20) b. Order numbers within 15(20), compare quantities within 15(20) c. Awareness of structure and pattern of 2-digit numbers within 15 (20) d. Appreciate the composition of 2-digit numbers

	subtraction (until First Class).		
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The following broad outline of work is strongly recommended, as per sample plans developed at Senior Infant level, based on PDST recommendations (see

http://www.pdst.ie/sites/default/files/RSGM_Snr%20Inf%20Scheme.pdf

Term 1	Term 2	Term 3
1) Early Mathematical Activities (RSGM) a) Sorting one, two collections b) Identify, copy, extend and make patterns in colour, shape and size 2) Number a) Counting to 10; finding cardinality to 10 b) Comparing and ordering within 10 c) Number recognition/formation within 10 (15, by end of term) d) Before/after/forwards/backwards within 10 e) Form sets of 10, match sets of 10 f) Use ordinal number (first, second, third, last) g) Combining within 10 h) Partitioning within 10 3) Shape and Space a) 2D Shapes b) 3D Shapes c) Spatial Awareness 4) Algebra 5) Measures a) Time 6) Data	1) Early Mathematical Activities a) Sorting three property collections b) Sorting using Venn diagram c) Sorting using Tree diagram d) Sorting using Carroll diagram 2) Number a) Counting, recognition, formation to 20 b) Identify the empty set, numeral 0 c) Comparing and ordering within 10 d) Combining within 10 e) Partitioning within 10 3) Measures a) Money (recognise to 20c, use to 10c) b) Weight	1) Early Mathematical Activities a) Sorting using logic blocks/Venn/Carroll/Tree diagrams b) Reasoning using logic blocks 2) Number a) Subtraction within 10(end of Term, as per RSGM) b) Counting backwards within 20 c) Comparing and ordering within 10 (revision) d) Combining within 10 (revision) e) Partitioning within 10 (revision) 3) Measures a) Length b) Capacity 4) Data

13.3. First Class

Concrete Materials: Concrete materials will continue to form the basis for the majority of new learning in First Class. They play a particularly significant role in developing children's understanding of place value.

o **Conceptual Place Value:** Children are encouraged to develop an understanding of conceptual place value, which emphasises strong mental strategies, an understanding of the relative size of numbers, an ability to relate numbers to each other and a flexible understanding of the value of different numbers. This understanding is of far greater significance than a rote ability to identify the value of digits as tens or units.

o **Base Ten Materials:** A range of materials for teaching place value and addition/subtraction are available. However, as children need to understand the use of ten as an iterative unit, they need several weeks experience in bundling units into tens before using pre-grouped base ten blocks (Dienes blocks). The initial stages of teaching place value, addition and subtraction should use ungrouped base ten materials.

o **Money:** As children will need to have a good understanding of place value to teach money, it should be taught in Term 3.

o **Fractions:** The link between the fraction (half) and the whole (one) should be emphasised. Linear, area and set models for representing fractions are recommended.

o The following active approaches and concrete materials are strongly recommended, in the sequence in which they are written:

Analysing numbers to 20	Place value	Adding without renaming	Adding with renaming	Subtracting without renaming
1. Ten frames and counters (See Mata sa Rang resources) 2. Using 10 x2 grid (See Ready, Set, Go Maths P. 151) 3. Unifix cubes 4. Cuisenaire Rods (particularly useful for missing addends $8 + \square = 10$) 5. Empty numberline	Pre-grouped concrete materials (e.g. Dienes blocks) should not be used at the early stages. 1. Counting Choir/ Counting forwards and backwards to 100 (to learn number names) 2. Bundling a variety of concrete materials into single tens (straws, lollipop sticks, unifix cubes). 3. Constructing tens with concrete materials, without units (x tens). 4. Constructing tens with single units remaining (x tens and y ones).	1. Adding numbers using a variety of concrete materials (without notation) 2. Adding numbers using concrete materials with children's own method of recording. 3. Adding using understanding of place value (e.g. adding tens and units separately, using an empty numberline, using the hundred square). 4. Adding numbers using vertical recording, using concrete materials and notation boards (ungrouped, then pregrouped).	1. Adding numbers using a variety of concrete materials (without notation) 2. Adding numbers using concrete materials with children's own method of recording. 3. Adding using understanding of place value (e.g. adding tens and units separately, using an empty numberline, using the hundred square). 4. Adding numbers using vertical recording, using concrete materials and notation boards (ungrouped, then pregrouped).	1. Subtracting numbers using a variety of concrete materials and digit cards to represent the number to be removed (without notation) 2. Subtracting numbers using concrete materials/digit cards with children's own method of recording. 3. Subtracting using understanding of place value (e.g. adding tens and units separately, using an empty numberline, using the hundred square). 4. Subtracting numbers using vertical recording, using concrete

	<p>5. Associate formal number names with tens (e.g. six tens is sixty). Repeat, including units.</p> <p>6. Record formal symbols on place value chart.</p> <p>7. Equivalent groupings: (e.g. 53 = five tens and three units, or four tens and 13 units) 8. Arrow cards</p>	5. Adding numbers vertically without using concrete materials.	5. Adding numbers vertically without using concrete materials.	<p>materials, digit cards and notation boards (ungrouped, then pregrouped)</p> <p>5. Subtracting numbers vertically without using concrete materials.</p>
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The following schedule is strongly recommended:

Term 1	Term 2	Term 3
<p>1) Number (within 20) a) Counting and Numeration b) Comparing and ordering c) Operations: Addition (within 20) d) Place Value within 99 (after midterm)</p> <p>2) Measures a) Time b) Length</p> <p>3) Data</p> <p>4) Algebra</p> <p>5) Shape and space a) Spatial Awareness b) 2D Shapes</p>	<p>1) Number a) Counting and numeration b) Comparing and Ordering c) Operations: Addition without renaming (within 99) and Subtraction (within 20) d) Place Value within 99</p> <p>2) Algebra</p> <p>3) Measures a) Time b) Weight</p> <p>4) Shape and Space a) 3D Shapes</p>	<p>1) Number a) Counting and numeration b) Comparing and Ordering c) Operations: Addition with renaming (within 99) and Subtraction (within 99) d) Place Value e) Fractions</p> <p>2) Measures a) Money b) Capacity</p>

13.4. Second Class

o Concrete Materials: Concrete materials continue to play an important role in consolidating and extending children's understanding of concepts, including place value.

o Conceptual Place Value: Children are encouraged to develop an understanding of conceptual place value, which emphasises strong mental strategies, an understanding of the relative size of numbers, an ability to relate numbers to each other and a flexible understanding of the value of different numbers. This understanding is of far greater significance than a rote ability to identify the value of digits as tens or units.

o Base Ten Materials: A range of materials for teaching place value and addition/subtraction are available. However, as children need to understand the use of ten/hundred as an iterative unit, they need several weeks experience in bundling units into tens, and tens into hundreds before using pregrouped base ten blocks (Dienes blocks). The initial stages of teaching place value, addition and subtraction should use ungrouped base ten materials.

o Money: As children will need to have a good understanding of place value to teach money, it should be taught in Term 2/3.

o Fractions: The link between the fractions (halves, quarters) and the whole (one) should be emphasised. Linear, area and set models for representing fractions are recommended.

o The following active approaches and concrete materials are strongly recommended, in the sequence in which they are written:

Place value	Subtraction with renaming
1. Counting Choir/ Counting forwards and backwards to 200 (to learn number names)	1. Encourage mental strategies such as moving on the hundred square, subtracting tens/units separately.
2. Bundling a variety of concrete materials into single tens (revision) (straws, lollipop sticks, unifix cubes).	2. Use materials grouped by children (eg. Lollipop sticks) and informal notation.
3. Bundling a variety of concrete materials into hundreds	3. Use pregrouped materials (Dienes) and informal notation
4. Associate formal number names with the numbers 100-199. (e.g. 11 tens is one hundred and ten).	4. Use pregrouped materials (Dienes) and formal, vertical algorithm
5. Record formal symbols on place value chart.	5. Use formal, vertical algorithm without concrete materials. The number to be subtracted should be represented by digit cards.
6. Equivalent groupings: (e.g. 153 = One hundred, five tens and three units, or fifteen tens and 13 units)	
7. Arrow cards	

Term 1	Term 2	Term 3
1. Number a) Operations: Addition with and without renaming, subtraction without renaming b) Place Value within 99 c) Counting and numeration within 99 d) Fractions e) Comparing and ordering 2) Algebra 3) Shape and Space a) 2D Shapes b) Angles c) Symmetry 4) Measures a. Time	1) Number a) Counting and numeration within 199 b) Operations: Addition with and without renaming, and subtraction with and without renaming within 99 c) Place Value within 199 2. Measures a) Money b) Time c) Area 3) Shape and Space a) Spatial Awareness b) 3D Shapes	1) Number a) Addition and subtraction (with/without renaming) within 199 2. Measures a) Length b) Capacity c) Area d) Money 3) Algebra a) Extending and using pattern 4) Data

14. Appendix D: Numeral Formation Rhymes



15. Appendix E: Mental Mathematics

Mental strategies are an important aspect of mental Maths. Children should be able to draw on a range of mental strategies to solve different operations. Being able to use these strategies lessens a reliance on formal computations. Whenever possible, children should be encouraged to share their own mental strategies with other children. This will allow for a variety of strategies to be shared in the class. See the PDST Mental Maths strategy handbooks for advice and ideas:

<http://www.pdst.ie/sites/default/files/Mental%20Maths%20Workshop%201%20Handbook.pdf>

15.1. Addition and Subtraction Mental Strategies The following strategies should be explicitly taught/revised at each class level, while drawing on those previously taught

Class	Commutative property	Facts of 10	Counting forwards and backwards	Doubles/near doubles	Bridging through ten	Reordering	Think addition	Skip counting
JI			X					
SI	X	X	X					
1 st class	X	X	X	X				
2 nd class			X	X	X	X	X	X We endeavour to ensure that