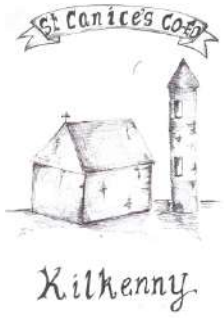

St Canices's Co-Ed
Maths Plan
2023

Introductory Statement and Rationale

(a) Introductory Statement
This plan was formulated by the teaching staff of St. Canice's in consultation with the Board of Management. This latest review took place in 2022.

(b) Rationale
- To benefit teaching and learning in our school
- To conform to principles of learning outlined in the Primary School Curriculum
- To review the existing plan for mathematics

Mathematics Education gives the child a language and a system through which he/she may analyse, describe and explain a wide range of experiences, make predictions and solve problems. Mathematics education fosters creative and aesthetic development and enhances the growth of reasoning through the use of investigative techniques in a mathematical context.

Vision and Aims

(a) Vision
Our school cherishes all pupils equally and, to aid them in achieving their true potential we realise that mathematics encompasses a body of knowledge, skills and procedures that are essential for child and adult

(b) Aims
We endorse the aims of the Primary School Curriculum for mathematics
- To develop a positive attitude towards mathematics and an appreciation of both its practical and its aesthetic aspects
- To develop problem-solving abilities and a facility for the application of mathematics to everyday life
- 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 reading basic number facts.

Curriculum Planning

Broad Objective
When due account is taken of intrinsic abilities and varying circumstances, the mathematics curriculum should enable the child to

Skills development
- Apply mathematical concepts and processes, and plan and implement solutions to problems, in a variety of contexts
- Communicate and express mathematical ideas, processes and results in oral and written form
- Make mathematical connections within mathematics itself, throughout other subjects, and in applications of mathematics in practical everyday contexts
- Reason, investigate and hypothesise with patterns and relationships in mathematics
- Implement suitable standard and non-standard procedures with a variety of tools and manipulatives
- Recall and understand mathematical terminology, facts, definitions and formulae

Number

- Understand, develop and apply place value in the denary system (including decimals)
- Understand and use the properties of number
- Understand the nature of the four number operations and apply them appropriately
- Approximate, estimate, calculate mentally and recall basic number facts
- Understand the links between fractions, percentages and decimals and state equivalent forms
- Use acquired concepts, skills and processes in problem-solving

Algebra

- Explore, perceive, use and appreciate patterns and relationships in numbers
  Identify positive and negative integers on the number line
- Understand the concept of a variable, and substitute values for variables in simple formulae, expressions and equations
- Translate verbal problems into algebraic expressions
- Acquire an understanding of properties and rules concerning algebraic expressions
- Solve simple linear equations
- Use acquired concepts, skills and processes in problem-solving

Shape and space

- Develop a sense of spatial awareness
- Investigate, recognise, classify and describe the properties of lines, angles, and two-dimensional and three-dimensional shapes
- Deduce informally relationships and rules about shape
- Combine, tessellate and partition two-dimensional shapes and combine and partition three-dimensional shapes
- Draw, construct and manipulate two-dimensional and three-dimensional shapes
- Identify symmetry in shapes and identify shape and symmetry in the environment
- Describe direction and location using body-centred (left/right, forward/back) and simple co-ordinate geometry
- Use acquired concepts, skills and processes in problem-solving

Measures

- Know, select and use appropriate instruments of measurement
- Estimate, measure and calculate length, area, weight, capacity and average speed using non-standard and appropriate metric units of measurement
- Estimate, measure and calculate angles, time, money and scale using non-standard and appropriate units of measurement
- Recognise and appreciate measures in everyday use
- Use acquired concepts, skills and processes in problem-solving

Data

- Collect, classify, organise and represent data using concrete materials and diagrammatic, graphical and pictorial representation
- Read, interpret and analyse tables, diagrams, bar charts, pictograms, line graphs and pie charts
- Appreciate, recognise and express the outcomes of simple random processes
- Estimate and calculate using examples of chance
- Use acquired concepts, skills and processes in problem-solving.

Strands and Strand Units

(For content overview see Curriculum: Infants p.17; First & Second classes p. 37; Third & Fourth classes p.61; Fifth & Sixth classes p. 85)

	Infant Classes	**Rang 1 & 2**
Strands	**Strand Units**	**Strand Units**
Early Mathematical Activities	• Classifying • Matching • Comparing • Ordering	
Number	• Counting • Comparing and Ordering • Analysis of Number • Combining • Partitioning • Numeration	• Counting and Numeration • Comparing and Ordering • Place Value • Operations • Addition • Subtraction • Fractions
Algebra	• Extending Patterns	• Exploring and using patterns
Shape and Space	• Spatial Awareness • 3-D Shapes • 2-D Shapes	• Spatial Awareness • 3-D Shapes • 2-D Shapes • Symmetry • Angles
Measures	• Length • Weight • Capacity • Time • Money	• Length • Area • Weight • Capacity • Time • Money
Data	• Recognising and interpreting data	• Recognising and interpreting data

	Rang 3 & 4	Rand 5 & 6
Strand	**Strand Units**	**Strand Units**
Number	• Place Value • Operations • Addition and Subtraction • Multiplication and division • Fractions • Decimals	• Place Value • Operations • Addition and Subtraction • Multiplication and division • Fractions • Decimals and Percentages • Number Theory
Algebra	• Number Pattern and sequences • Number sentences	• Directed numbers • Rules and properties • Variables • Equations
Shape and Space	• 2-D shapes • 3-D shapes • Symmetry • Lines and Angles	• 2-D Shapes • 3-D Shapes • Symmetry • Lines and Angles
Measures	• Length • Weight • Capacity • Time • Money	• Length • Weight • Capacity • Time • Money
Data	• Representing and interpreting data • Chance	• Representing and interpreting data • Chance

Approaches and Methodologies

In the mathematics curriculum the strands and strand units are viewed through the lens of the approaches and methodologies. (Refer to Teacher Guidelines: Mathematics pp. 30 - 67)

General

All children should be provided with the equal opportunity to access all strands, including members of the Traveller community, children experiencing any form of disadvantage, children with disabilities, families with literacy problems and families of whom English is not the first language.

- Through adequate timetabling within each class
- Ensuring that pupils receiving supplementary teaching from the SEN teacher are not withdrawn from class during their maths time (unless this is of benefit to the particular child).
- Ensuring there is less emphasis and reliance on textbooks and workbooks and more on active learning strategies, where possible.
- Ensuring that the textbooks we do use are in line with content objectives for the class level.
- Encouraging the appropriate use of concrete materials in all classes through the school and not just in the junior classes.

- Providing opportunities for all children from fourth to sixth class to use calculators.
- Allowing pupils to collect real data in other areas of the curriculum and using it to represent their findings.
- Engaging in estimation strategies through every appropriate strand within the maths curriculum e.g. Shape and Space.
- Using whole school strategies and initiatives to raise the profile of mathematics as a subject to be enjoyed by all children- Maths Week, 'Maths for Fun', Maths Trails.
- Teachers ensure that the relevant Maths language is implemented appropriately and in context formally through Maths instruction and informally across the Curriculum. (See Appendix 1)
- Exposing children to a Maths rich environment both within the classroom and in the wider school environment.

Talk and discussion

Guided discussion and discussion skills

Talk and discussion in mathematics is taken seriously and seen as an integral part of the learning process.

- We provide opportunities for pupils to explain how they got the answer to a problem, discuss alternative ways of approaching a problem or give oral descriptions of group solutions.
- Discussion skills are enhanced by turn taking, active listening, positive response to the opinion of others, confidence in putting forward an opinion, ability to explain clearly their point of view.

Scaffolding

- Teachers actively model the language to be used, particularly when talking through the problem solving process.

Integration/Linkage

- A thematic approach will be used for linkage within mathematics and integration across all areas of the curriculum.
- Can we identify opportunities where a thematic approach could be used across a number of subjects? (See Teacher Guidelines: Mathematics pp. 53 and 57 for examples)

Number facts

- There are different approaches to the teaching of number facts (tables), e.g. for 3 X 4, we say three fours, three multiplied by four, three times four, three groups of four.
- Children are aware of the commutative properties of multiplication tables and of their relationship with division.
- We teach subtraction and division tables separately from addition and multiplication.
  They are taught in the order of
  -addition and subtraction in First and Second
  -revision of addition and subtraction in Third and Fourth
  -introduction of multiplication and division in Third and Fourth
- Addition – top to bottom, doubles, patterns, making ten, near doubles etc
- Subtraction – we use concrete materials in the initial stages (depending on ability) along with the crossing out of pictorial representations.
- We also focus on subtraction in its vertical state.

- When we are subtracting using regrouping we will focus on the "crossing out method" once the initial work has been done and the concept is understood.
- As a staff, we have agreed that this will facilitate quicker work for those with a good understanding of maths and will allow those who have difficulties in the area to follow a set number of steps to allow for accurate answering.
- Multiplication – we follow the steps of; skip counting initially, using mental strategies such as identifying doubles, near doubles, multiplying by 5 and 10, using games to reinforce facts, developing and honing estimation skills.
- We also focus on the vertical method of representation once simple multiplication has been mastered.
- Division – we begin with the concept of sharing, moving on to understanding divisions as repeated subtraction, developing and honing estimation skills.
- We use all of the methods of representing division in all classes in order to ensure pupils are familiar with all of the guises.
- We add and subtract fractions using pictorial representation initially and then moving on to the formula "find a common denominator".
- We use these correct terms always.
- We add and subtract time by converting an hour to sixty minutes initially when needed.
- Mathematical games are in use at each level, e.g. dice, cards, dominoes, spinner games
- Websites are used to support the teaching of mathematical concepts. Many of the games on these sites are used in classes throughout the school.

Collaborative and co-operative learning

- We ensure that children learn the skills needed to work as a group rather than just in a group - listening to others, turn-taking, appreciating that others' opinions are important.
- Opportunities are provided for children to learn from their peers, e.g. buddy systems, think/pair/share, problem solving in groups.
- Each class uses a variety of organisational styles - pair work, group work and whole class work.

Problem-solving

Problem solving should develop the ability to plan, take risks, learn from trial and error, check and evaluate solutions and think logically.
Discussion and acceptance of the points of view of others is central to the development of problem solving strategies.
Children need to develop problem solving skills in general and be confident in their ability to attempt a solution.

- Children will be taught a number of strategies for problem solving. These strategies will vary according to the child's age.
- Use of concrete materials
- Draw a picture or diagram
    - RUDE – Read, Underline, Draw, Estimate
    - RUCSAC – Read, Understand, Choose, Solve, Answer, Check
- The teacher may need to structure the problems given to the children so that they experience success.
- Rereading of the problem by the child will be encouraged.

- Cooperative group work and class discussion of the results of a problem solving exercise is encouraged. Children are asked to try different approaches themselves, to offer alternative solutions and to try them out on the board.
- Senior children are encouraged to invent problems for others to solve and discuss the results.
- Teachers will endeavour to relate problems to real life situations e.g. shipping, measuring, holidays, surveys and data.

Assessment and Record Keeping

(See Curriculum pp. 114-121, Teacher Guidelines pp. 64-65, the school's Assessment Policy)

- Assessment is used to direct teaching and learning, on both a class and school basis. This is done following the Standardised Tests in the final term.
    - Standardised Tests are administered from First to Sixth each year in May/June. Results are relayed in the form of STENs via parent/teacher meetings and report cards.
    - Teachers administer their own class based tests at their discretion and results are kept in their own records.
- We ensure that a broad range of assessment tools are being used.
- Teacher observation
- Teacher-designed tests and tasks
    - Work Samples
    - Diagnostic tests (mainly SEN support)
- All records are managed and stored in line with the school's policy on record keeping.

Children with different needs

Children with learning difficulties

(Refer to school's Learning-Support Policy)

- Our school policy allows for flexibility within the Maths programme to accommodate children with different abilities.
- Children with special needs have access to all strands of the Primary School curriculum.
- Teachers will tailor the Mathematics Curriculum to make it accessible to all pupils.
- Differentiation is used within each class. This may be within the areas of expected outcome, teaching style, resource used
- The SEN team provides supplemetary teaching in Maths for children with learning difficulties once time is available on the SEN schedule.
- The SEN team have access to many resources.
- SETs regularly meet with class teachers in relation to support plans for children receiving SEN Support.
- ICT may be used to support teaching and learning for children with special needs.
- Resources for mathematics may be purchased with approval from the principal.

Children with exceptional ability

- The school will provide a range of strategies to provide challenges for children of exceptional ability.
    - Teachers may provide a differentiated programme

- ICT may be used to support their work
- Maths Club

Timetable

- When drafting timetables for withdrawal of pupils for supplementary teaching, teachers include these pupils for as much of the mainstream mathematics programme as possible.
- Infants receive 4 hours of maths per week while all other classes receive 5 hours per week.

Homework

(Refer to school's Homework Policy)

- Mathematics homework reflects the active learning approach as described in the curriculum.
- As a staff we believe that mathematics homework is a vital component of Home/School relations. Homework in this area should inform parents of the work being done at school and allow for consolidation of same.
- Teachers differentiate homework taking into account the range of abilities within the class. This will be reflected in the cúntaisí míosúla.
- We ensure that children attending SEN support are not going home with two sets of mathematics homework. This is done through constant communication between teachers and is taken on a case by case basis.

Resources

(Refer to Teacher Guidelines: Mathematics p. 18, pp.72-73)
Equipment, textbooks, supplementary materials, calculators See Appendix 2

- Current textbook Busy at maths CJ Fallonand Assesment Tests, Prim-Ed Mental Maths.
- Each class has supplementary resources such as posters that correspond to the Maths curriculum.

ICT

(See Teacher Guidelines: Mathematics pp. 60-61, Information and Communications Technology (ICT) in the Primary School Curriculum: Guidelines for Teachers)

- Each class has a whiteboard which teachers use daily to enhance the teaching of Mathematics.
- Teachers have access to online resources through maths programmes
- The schools Acceptable Usage policy ensures safe Internet usage

Individual teachers' planning and reporting

- Teachers' individual yearly and fortnightly plans are informed by the whole school plan and the curriculum documents for mathematics
- New teachers/substitutes are able to access the school plan in the purple Policy Folders in each classroom. The principal will provide information on this when required.
- Cúntaisí míosúla serve in reviewing and developing the whole school plan/individual teacher preparation for following years.

Staff development

- Teachers have access to current research, reference books, resource materials, websites, associations dealing with mathematics
- Staff meetings, under Croke Park Hours are used to facilitate the sharing of this information
- Teachers are encouraged to attend courses in the area of numeracy, online, in Education Centres as part of C.P.D and to relay information gathered to whole staff
- Opportunities for team-teaching can be facilitated in classes using SEN support
- Teachers have access to current research, reference books, resource materials, websites, associations dealing with mathematics

Parental Involvement

Parents will be encouraged to develop

- An awareness of maths in the home and wider environment e.g. colours, numbers, shapes and space, weight, length, capacity, time, shopping.
- Parents are encouraged to work with their children in developing mathematical language by participation in:
  - homework assignments
  - out and about activities
- Information is shared with parents
  -Induction meeting for Junior Infants
  -Parent Teacher Meeting
  -Newsletter
  - Parent Information booklet (See Appendix 3)

Lay-out of Copies

Draw all lines in pencil or biro using a ruler.

- Write down the number of each sum in the margin.
- Put each figure in a square of its own.
- Put decimal point in the middle of a square.
- Where appropriate, write 'Ans =' under each sum, leaving a line above and below.
- Draw a line under each answer.

Organisational Planning

Calculators

- These are used formally from 4th Class onwards.
- Calculators can make problem-solving more accessible to low achieving children who might otherwise never experience correct problem solution because of frequent computational errors.
- By removing the obstacles of what, for some children, are complicated algorithms, more time is available for discussing what the problem is, possible strategies for solving it and developing estimation skills.

Brainstorm: In a whole-class situation, focus a discussion which may direct the pupils to solve a problem, perhaps, using some of the other strategies.

Implementation/Review

Roles and Responsibilities

This plan will be implemented by the teachers and the Principal of the school. The plan will be monitored and evaluated regularly by the post holder and maths co-ordinator.

Ratification and Communication

This plan was ratified by the Board of Management in February 2023.
The plan will be made available on the school website in February 2023.

Appendix 1

Language In Maths

Junior Infants	*Senior Infants*	*Rang 1*	*Rang 2*
Sort same as big, bigger, etc., tall, heavier, etc. long short - shorter, shortes curved, round, inside, above too many, enough straight, corner, outside, below how many more? first, second, third etc. shape object match/mark, join full, empty, 'holds' all terms re time, moving etc. early, late more, less, few/fewer, others 2D, circle, rectangle, square, triangle Who? How? Why? Zero numerals one, two etc. colour same length, weight, height small to, from, before, after, set roll, stacked pattern coins how much?	*As Junior Infants plus:* Compare/count on/back add greater than/less than high, low today, yesterday, tomorrow days of week etc. holds most/least/the same joined, between, next to straight out, front, back, high low, around number strip least same as money how long, short, heavy copy thick/thin holds more than/less than over, under, on, in, open, closed charts go back 3D shapes, names cube/cuboid most, heaviest etc. how far/how far more? break up groups wide, narrow months, seasons o'clock amount measure words for numerals	*As Senior Infants plus:* less, more smaller, greater take away how many more? days of week between clock problem circle, square, rectangle faces, edges left over number line fraction missing numeral centimetre calendar half past bar chart counting in 2's etc. capacity addition number subtraction rest of them measure change tens/ones/unit months make tens graph sphere, cylinder, cone cube, cuboid, pyramid magic square 100 square odd, even make the same as group, order subtract, steps abacus pictogram symmetry	*As 1st class plus:* missing numbers half quarters in order rename metre, centimetres grid hundred sign shaped base 10's etc. number sentence minutes/hours, quarter past/to digital code subtract midday timetable seasons tessellate a.m./p.m. prism, cuboid, cylinder black graph forward, backwards place value add, group difference between counting distance midnight magic square 2D, 3D pictogram different

Rang 3	**Rang 4**	**Rang 5 & 6**	
As Rang 2 plus: symmetry covering area language of division and multiplication mathematic sentence versus written renaming/regrouping 2 x 3 =6 divide/divided by/division etc. capacity/liquid/litres/mls product weight – grammes/kgs factors length – metres, cms, mms set pictogramme angle, right angle, horizontal decimal vertical, diagonals fractions – halves, quarters, thirds, sixths rectangle, cuboid, triangle, Bar charts less than/greater than Shared equally Estimation	*As Rang 3 plus:* division & multiplication – estimate, remainder Quantity capacity weight more/less, litre, millilitres kg, light, lighter, etc. heavy ects into, by, from, under, value, more, less pointed, straight, square, solid, angle shapes horizontal, vertical, sloping, parallel, congruent half, quarter, eighth etc./divide, shade, frame figure polygons, polyhedron quadralateral	*As Rang 4 plus:* fractions oblong percentage shapes area octagon length, width, surface, diametre rhombus, quadrilateral circumference, radius, base, perpendicular height axis, reflection, image, parallel oval, polydon protractor 3D – cylinder-sphere, cone, cuboid, pyramid triangular prism, tetrahedron rotation, symmetrical aggregate	

Appendix 2

Mathematical Equipment

Number	Shape & Space	Measures	Weight	Capacity
Various Number Lines Counters Beads String Buttons Unifix Cubes Spools Cuisenaire Rods Pegboards and Pegs Hundred Square (with and without numbers) Fraction, decimal and percentage walls Playing cards Dominoes	2-D and 3-D shapes 3-D nets Geo-boards Tangram sets Blackboard compass 360° and 180° protractors Set-squares Gummed paper Paper shapes Construction straws	Trundle-wheel Tape measures Rulers Ribbon or string	Balance Kitchen scales Weights	Litre, half and quarter-litre containers Varied collection of containers for comparison Funnels Measuring jugs