

Craggagh National School

Mathematics Policy

2012

Craggagh National School

Balla, Co Mayo.

Tel: 094 9365177 **Email:** Principal@CraggaghNS.ie **Roll No:** 12467R

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1 Introductory Statement and Rationale:

1.1 Introductory Statement

This document is a statement of the aims and objectives, principles and strategies for implementing the mathematics programme at Craggagh NS.

It was formulated by the school staff and informed by the Curriculum Statements and Curriculum Guidelines (1999), the Literacy and Numeracy for Learning and Life Document (2011), Circular 0056/2011, the needs of the children in Craggagh NS and the expertise and experience of the staff of Craggagh NS.

1.2 Rationale

- To maintain and develop high numeracy standards in Craggagh NS
- To provide a coherent, consistent whole school plan which informs teachers' yearly plans
- To increase the profile of numeracy in school
- To enhance children's problem-solving strategies
- To provide a structure for regular analysis of numeracy standards leading to more focused teaching and learning

2 Vision and Aims

2.1 Vision

In keeping with the ethos and philosophy of the school, where each child is valued in the diversity of their needs, this Maths plan is intended to aid each pupil in maximising his/her individual level of potential.

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2.2 Aims

- To develop a positive attitude towards mathematics, and to appreciate and recognise its *practical* aspects.
- To develop *problem solving skills*, and the facility for using mathematics in everyday life
- To use the *associated language* of mathematics effectively and accurately
- To develop an understanding of *concepts and processes* in order to effectively apply mathematics to everyday life, appropriate to each child's level of development and ability.
- To enable each child to acquire proficiency in fundamental mathematical skills and in recalling basic number facts.
- To give all pupils the opportunity to succeed regardless of ability.
- That assessment and revision are an integral part of the maths curriculum.
- That maths are fun and enjoyed by all members of the school community.
- That detailed analysis of standardised tests (Sigma T) will take place every year with a view to identifying areas of strength and weakness.

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Content of Plan

3 Curriculum

3.1 Curriculum Overview

Strands and Strand Units

Strands	Infant Classes Strand Units	1st and 2nd Classes Strand Units	3rd and 4th classes Strand Units	5th and 6th Classes Strand Units
Early Mathematical Activities	Classifying. Matching. Comparing. Ordering.			
Number	Counting. Comparing and Ordering. Analysis of number.	Counting and numeration. Comparing and ordering. Place value. Operations. Fractions.	Place value. Operations. Fractions. Decimals.	Place value. Operations. Fractions. Decimals and percentages. Number theory.
Algebra	Extending patterns.	Exploring and using patterns.	Number patterns and sequences. Number sentences.	Directed numbers. Rules and properties. Variables. Equations.
Shape and Space	Spatial Awareness. 3-D shapes. 2-D shapes.	Spatial awareness. 2-D shapes. 3-D shapes. Symmetry. Angles.	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. Area. Weight. Capacity. Time. Money.	Length. Area. Weight. Capacity. Time. Money.	Length. Area. Weight. Capacity. Time. Money
Data	Recognising and interpreting data.	Representing and interpreting data.	Representing and interpreting data. Chance.	Representing and interpreting data. Chance.

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3.2 The Maths Curriculum in Craggagh NS

The Planet Maths scheme (Folens) is being used from infants to 6th class. There is agreed uniformity of approach, language and method throughout the school, for basic computation such as ‘regrouping/renaming’ methods in addition and subtraction, to minimise potential for difficulty. However, as children progress through the school, particularly in the middle and senior classes, they will be introduced to the range and variety of mathematical language that may be used for a given operation (e.g. for multiplication: 4 times 4, 4 by 4, 4 4s, product of 4 and 4). We believe it is important to expose children to as much of this language as is practical, always with due cognisance given to those who may experience difficulty.

1st to 6th classes use ‘Master Your Maths’ or a similar Problem Solving scheme, daily, or as often as possible to reinforce previously learned concepts and to dedicate time every day specifically to Problem Solving. These classes will also spend time daily (or as often as possible) on mental maths, practicing mastery of basic number facts, times tables, multiples, factors etc. through a variety of methods.

Problem Solving has been identified nationally as an area of concern and a common whole school approach was suggested to us in our recent WSE (Dec 2010). We have agreed to use R.U.D.E. (Read, Underline, Draw, Estimate). This method will be displayed prominently in classrooms.

4 Approaches and Methodologies

4.1 General

- Problem solving has been identified as an area of weakness countrywide (Strategy for Literacy & Numeracy). There is agreement in Craggagh NS of the need to promote/prioritise this area of the maths curriculum. The R.U.D.E. strategy will be used in all classes.
- There is an agreed need for more utilisation of *concrete materials* in order to facilitate a more meaningful practical approach to Maths, incorporating ‘*active learning*’, such as in measuring. ‘If children are to learn from *doing* they must *do*’, (Revised Curriculum Guidelines). Resources are shared throughout the classes, with all being available to each teacher when needed. DEIS and SEN resources are the responsibility of corresponding teachers.

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- All children will be provided with the opportunity to access the full mathematics curriculum. Each class utilises the appropriate textbook. This is to ensure that the content objectives for the class level are attained.
- For children receiving supplementary teaching in the form of Learning Support/Resource teaching, I.E.P.s / I.P.L.P.s are formulated and reviewed each term with communication between class teacher, parents and L.S./R.T. ongoing to ensure needs are facilitated.

4.2 Agreed Approaches in Craggagh NS

- Addition: – top to bottom, mental strategies in identifying doubles/near doubles, make 10.
- Subtraction: - use of materials and decomposition.
- Multiplication: - skip counting, horizontal and vertical presentation of single digits, vertical presentation of bigger numbers, understanding multiplication as repeated addition, mental strategies in identifying doubles/near doubles, multiply by 5 or 10, games and tests/challenges to reinforce facts
- Division: concept of sharing, understanding division as repeated subtraction
- More widespread use of concrete materials and games has been introduced into the classroom since the implementation of the revised curriculum.
- Oral/Mental maths to be further developed in each classroom.
- Calculators are available from 4th-6th for use in problem-solving, to check answers and to generally facilitate weaker pupils.
- Number limits are adhered to
- **Junior Infants** Numerals 0-5 Counting to 10;
- **Senior Infants** Numerals 6-10 Counting to 20;

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- *1st class* up to 99; *2nd class* up to 199; *3rd class* up to 999; *4th class* up to 9,999.
- Formulae are ‘discovered’ rather than taught e.g. through opportunities to measure and estimate area, pupils will discover ‘length X width’ formula
- Pupils collect ‘real’ data from other areas of the curriculum and use this to represent their findings.
- Estimation skills are developed across the maths curriculum in measuring area, length, width, shapes, time and in number with the *rounding strategy* rounding to the nearest 10, 100 etc. The *front-end strategy* is suited to higher classes.
- Multiplication and division tables are learned from 2nd class upwards. (Addition and subtraction from 1st). Thinking strategies 1st class : +0; +1; +2; doubles; near doubles e.g. $6+7=13$. A variety of methods are engaged in for learning. The order 2x, 4x, 8x followed by 3x, 6x, 9x, is used in order to facilitate a link between the answers in preparation for fractions. Use of table charts is encouraged where there is a specific learning difficulty such as dyslexia.

5 Talk and Discussion

We endeavour to provide an environment where talk and discussion are an integral and valuable part of the mathematics process in ways such as teacher/pupil, pupil/pupil and pupil/teacher.

5.1 Scaffolding

Teachers actively model the language necessary for maths, particularly when talking through the problem-solving process or through computation.

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5.2 Integration

P.E: Timing for sports events, measuring the field for 50m race etc.

Science: Measures-experiments, measuring temperature

History/Geography: Data presentation for projects/ timelines /coordinates/scale/mapping directed numbers etc

Gaeilge: Cen t-am e?/ An Sipoa (airgead)

Music: Timing, beats etc

Art: Spatial awareness, shape and space

IT: Using spreadsheets (Excel) for Data, creating charts (bar, line, pie). Using “Scratch” and other programming software to develop problem-solving skills, explore the use of and enhance understanding of variables. Using co-ordinates.

5.3 Linkage

A thematic approach may be taken and linkage between the Strands of mathematics can be created e.g. Olympic Games, *Transport* etc

Measures: **Width:** of the train track, distance from place to place **Time:** time-tabling, time taken to travel, average speed **Weight:** weight allowances on flights **Money:** cost of petrol and diesel, cost of journey

Shape and Space: shape of trains, planes etc. **Parallel:** tracks for trains

Number: all aspects of number can be used number of airports, number of train stations in each county, percentage of population/school population using/has used each mode

Data: Data collection and manipulation, averages, bar charts, pie charts, graphs of results
Linkage may also be created between decimals, fractions and measures.

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5.4 Mathematical Language in Context

Common approaches to language

- Addition: add, total, sum of, plus, altogether.
- Subtraction: minus, take-away, subtract, less than, difference, from.
- Multiplication: times, multiply, by, groups of, product, of.
- Division: divide, share, split, groups of, into.
- Equals: the same as, means, is, will be, answer is, makes.

Although a common approach is taken, by 2nd class pupils will be familiar with a variety of terms for each mathematical symbol + - and = and by 3rd and 4th class the symbols x and \div .

5.5 Number Facts

- There is a common approach to tables e.g. in the 3x tables we count the groups of 3 2x3, 4x3, 5x3 etc
- Beginning in 3rd class, pupils become aware of the commutative properties of multiplication and their association with division.
- Tables are done separately and are learned off as number facts.

6 Active Learning and Guided Discovery

“Tell me and I forget. Teach me and I remember. Involve me and I learn”

Benjamin Franklin

6.1 General

It is school policy to use appropriate concrete materials at all levels:

- Concrete materials play an important role in concept development. They provide a link to connect the operational to real world problem-solving situations.

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- Experience with concrete materials also facilitates the development of appropriate language as children communicate about what they are doing and what they see happening.
- As they use models children should also begin to understand the symbolism related to the operation.

Teaching materials will be provided at all class levels and in every strand. Children will experience a variety of materials. A variety of teacher designed workshops, photocopyable master books, teacher reference books and textbooks will be used in order to present work to the children in a variety of ways. Calculators, (4th to 6th) and computers will enhance the implementation of the curriculum.

6.2 Collobrative and Co-Operative Learning

We will make use of *guided discussion*, making provision for *group work*, valuing both oral and practical, using informal games as well as formal procedures. Games in use are cards, dice, bingo, loop games, time games, interactive games and board games.

A variety of organisational styles is in use in each classroom such as *group work*, *whole class work* and *individual work*.

6.3 Using the Environment

- Maths is taught using the child's environment which reinforces skills learned and provides opportunities for using these skills.
- Maths Trails are used at each class level.
- A conscious effort is made to use the child's own ideas and environment as a basis for reinforcing mathematical concepts e.g. a height chart to measure his/her own height and compare it again at the end of the year and

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mathematical language e.g. teacher is taller than you are, the pitch is wider than the classroom etc.

- There are number games painted onto the school playground.
- Units of measurements are marked around the school.
- The school yard will be used for teaching concepts of Area and Perimeter in senior classes.
- Large circles (centre circle in basketball court) for exploring relationship between radius, diameter and perimeter.

7 Skills Through Content

Skills are actively developed through content and are transferred across the curriculum.

- ***Applying and problem-solving*** e.g. Selecting appropriate materials and processes in science.
- ***Integrating and connecting*** e.g. recognising the use of mathematics in the environment.
- ***Reasoning*** e.g. exploring and investigating patterns in art and music.
- ***Implementing*** e.g. using maths as an everyday skill such as in the shop, telling the time etc.

Understanding and recalling e.g. understanding and recalling terminology, definitions, facts and formulae.

8 Presentation of Work

There is an agreed uniform use of terminology throughout the school, eg 'Take away' is used initially while 'subtract/minus/from' are introduced as the concept is understood. Our policy on subtraction is the 'regrouping/renaming' method.

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A variety of methods may be employed to present pupil's work though it is mainly presented in squared maths copies. Other methods include – Charts and graphs, pictures, ICT programmes.

9 Children with Different Needs

(see also, policy on learning support)

Class Teacher Strategies for inclusion:

- Mixed ability and friendship grouping
- Collaborative and Co-operative work
- Use of concrete materials
- Games- Bingo, What time is it? etc
- Valuing participation in oral work
- Rewarding effort.

All relevant school employees are informed of integration strategies by the class teacher. Specific difficulties such as dyslexia, dyspraxia and speech and language difficulties are the main learning disabilities encountered in our school. The class teacher and learning support teacher support these learners from the earliest indication and provide intervention based on:-

- **Enrolment forms** indicating any early milestone difficulties
- The **staged approach** (outlined in Special Ed policy)
- Following any recommendations on psychological reports

Class teachers ensure the participation of these learners by firstly establishing their learning needs, and not asking children with identified learning disabilities to perform beyond their capabilities.

The amount of class work may be *differentiated* according to the needs of individual children. The number of tables and the tables themselves may also be differentiated to ensure maximum participation and motivation.

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It is the responsibility of the class teacher to identify the learning needs of each child. It is the shared responsibility of the class and learning support teachers to ensure these needs are catered for.

The role of a SNA is to support the child in their needs under the direction of the class teacher.

When **IEP's and IPLP's** are being compiled by the learning support / resource teacher, input is necessary from the class teacher to inform the LS/RT of strengths and weaknesses not always apparent in a supplementary teaching situation.

Children with different learning need will have access to the full mathematics curriculum but *at his/her learning rate*. A differentiated programme may be necessary to fulfill this. In this programme, real life skills e.g. money and time will be prioritised. More able pupils will be facilitated by the use of additional material, brain teasers, challenges etc.

10 Equality of Participation and Access

- Equal opportunities are afforded to boys and girls in the presentation of and participation in the mathematics curriculum in Craggagh NS.
- Children with disabilities (learning or physical) are catered for in the course of the class teacher's planning, with supplementary teaching available where necessary.
- All children have equal access to ICT resources

11 Organisation

11.1 Timetable

In accordance with the Literacy and Numeracy Strategy (2011), classroom time allocation is now increased to 4 hours and 25 minutes (3 hours 25 mins infant classes) for maths

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instruction. Maths will be integrated into other subjects, as outlined in **5.2** above and additional discretionary time may be allocated to maths teaching by individual teachers.

Where a pupil is attending Learning Support, every effort is made to insure that this withdrawal does not clash with maths time.

11.2 Homework:

Homework is given in line with general homework policy. Homework is differentiated to take into account the varying levels of abilities in each class. Every effort is made to coordinate homework between the class teacher and the learning support/resource teacher.

11.3 Rainy Day Activities:

Children will be encouraged to participate in maths-based during lunchtimes when it is too wet to go outside. These games include Battleship, Draughts, Chess, Connect Four etc.

12 Individual Teachers' Planning and Reporting:

It is envisaged that this document used alongside the curriculum documents and class texts when planning for the teaching of Mathematics in each class.

12.1 Staff Development:

Teachers keep abreast of current research, resource materials, websites, reference books etc. Information and expertise are freely shared among staff members. Teachers are encouraged to attend courses on aspects of mathematics teaching from time to time. Again, this expertise is then shared with other staff members.

12.2 Parental Involvement - Home School Links:

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Parents are made aware of the importance of mathematics in the learning process. Parents are made aware of the content of the mathematics programme and approaches/methodologies used through parent/teacher meetings and through their regular input into children's homework.

Contact is maintained through the newsletters, parent/teacher meetings and in homework diaries.

Assessment information is communicated regularly to parents through class tests (sent home to be viewed/signed), tables tests, reports and parent/teacher meetings.

The results of the SIGMA T standardised tests are communicated to parents orally at Parent/Teacher meetings and in written format in the end of year reports.

13 Assessment

(See also Assessment Policy 2012)

*“Assessment is about building a picture over time of a child's progress and/or achievement in learning across the Primary School Curriculum. Information about **how** the child learns (the learning process) as well as **what** the child learns (the products of learning) shapes the picture. The teacher uses this information to identify and celebrate the child's current learning, and to provide him/her with appropriate support for future learning.”*

Assessment in the Primary School Curriculum:
Guidelines for Schools (2007)

Assessment is an integral part of the teaching and learning process. A broad range of assessment tools are used in Craggagh NS:

- Teacher Observation
- Teacher designed tests

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- Work samples and projects
- Individual pupil portfolios
- Diagnostic tests (mostly in LS/RT)
- Standardised tests (Sigma T)

Sigma T Standardised tests will be administered in the final term each year, allowing sufficient time for communication of results to parents and time for teachers to evaluate the data.

We will use the detailed, colour coded system of marking. This breaks results into strands, allowing for easier identification of areas of strength or weakness across all class groups. Data will be processed through the Micra T CD and stored digitally (on the local server) as well as a hard copy of the results sheets which will be stored securely in the school.

14 Success Criteria

We will know this plan has been implemented when:

- Teachers' preparation is based on this plan
- Procedures in this plan are consistently referred to and followed

This policy will have achieved its aims when

- there is positive feedback from teachers/parents/children
- Children have a positive attitude to and appreciation of the value of mathematics
- Children have an interest in the mathematical aspects of every day life
- Children have an ability to engage appropriately in Problem Solving activities
- Children have confidence and competence in mathematics

15 Implementation:

Roles and Responsibilities

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The plan will be supported, developed and implemented by the whole school staff under the direction of the Principal who will co-ordinate the progress of the plan, and encourage and accept feedback on its implementation. Time will frequently be allowed at staff meetings to assess the work being done and the methodologies being used in every class room.

16 Consultation:

A draft of this policy will be made available to parents and the Board of Management and submissions may be made via the Principal.

17 Ratification and Communication:

This policy will be communicated to all teachers, parents and the Board of Management.

A PDF version will be made available for download on the school website (www.CraggaghNS.ie) and a hard copy will be provided on request.

This policy was ratified by the Board of Management of Craggagh National School on:

Date: 23/10/12

Signed: _____

18 Review:

This policy will be reviewed annually in conjunction with our School Improvement Plan.