Mathematics

Whole School Plan

Fossa National School

Killarney.

Contents

Introductory Statement

In light of the changes introduced in the Revised Primary Curriculum 1999 and with the increased availability of assistance and expertise in the construction of Whole School Plans, it was decided to review the existing provision for mathematics within the school.

(b) Rationale

The staff of Fossa National School have collaborated in the production of a plan for mathematics which we hope will be of help and guidance to all in affording our children the best opportunities of extending their mathematical knowledge.

All classes from Junior Infants to 6th use Busy at Maths as their core text book. Master your Maths

(1st and 2nd) and Maths Challenge (3rd to 6th) are used for Mental maths and Problem Solving.

Supplementary Book (Figure it Out).

Vision and Aims

(a) Vision

We hope that our mathematics curriculum will be one:
- which will involve the child as an active agent in his/her own learning both through play and through guided activity and discovery.
- which uses the child's knowledge and experience as a base for learning.
- which highlights that mathematics is an intellectual pursuit in its own right - a source of fascination, challenge and enjoyment.
- which will enable the child to apply what he/she has learned in a variety of situations.
- which will allow each child to reach their potential and ultimately play a meaningful role in their communities .

(b) Aims

The aims of this plan are:
1. To kindle and pursue, through hands on exploration and discussion, through active listening and co-operative learning, through the satisfaction of solving problems and through the development of an appreciation of shape and design, the child's enjoyment, enthusiasm, fascination and innate wonder for the subject of mathematics.
2. That the child will be enabled to acquire an understanding of mathematical concepts and processes to his/her appropriate level of development.
3. That the child will be enabled to acquire proficiency in fundamental mathematical skills and in recalling the basic number facts.
4. That the child will become familiar with the language of mathematics and develop the ability to use it to communicate mathematical ideas accurately.
5. That the child will be enabled to apply what he/she has learned outside the classroom by placing emphasis on presenting them with real problems related to their own experience and environment.

6. That they will learn the skills to predict and estimate thereby developing the ability to gauge with accuracy the validity of possible solutions.
7. To give all enrolled children in our school a greater confidence in engaging with the maths curriculum.
8. To enhance the children's enjoyment in learning mathematical skills particularly through engagement in real life practical maths.

Curriculum Planning

1. Strands and Strand Units

All teachers are familiar with the strands, strand units and content objectives in the Maths Curriculum and refer to them regularly when planning for their classes ensuring all strands and strand units are covered.

STRANDS	STRAND UNITS
Early Mathematical Activities (Infants)	Classifying, Matching, Comparing Ordering
Number	Counting, Comparing and Ordering, Analysis of Number (introduced in Infants) Numeration, Place Value, Operations: Addition, Subtraction, Fractions (introduced in 1st 2nd) Multiplication, Division, Decimals introduced3rd/4th) Percentages, Number theory (introduced in 5th/6th)
Algebra	Extending patterns (introduced in Infants) Extending and using patterns (introduced in 1st/2nd) Number patterns and sequences, Number sentences (introduced in 3rd/4th) Directed numbers, Rules and properties, Variables, Equations (introduced in 5th/6th)
Shape and Space	Spatial Awareness, 2D shapes 3D shapes (introduced in Infants) Symmetry, Angles (introduced in 1st/2nd) Lines and angles (introduced in 3rd/4th)

Measures	Length, Weight, Capacity, Time, Money (introduced in infants) Area (introduced in 1st/2nd)
Data	Recognising and interpreting data (introduced in Infants) Chance (introduced in 3rd /4th)
Problem Solving (SIP)	Incorporated in all aspects of the Numeracy curriculum.

The skills the children should develop include:
•Applying and problem solving
•Communicating and expressing
•Reasoning
•Implementing
•Understanding and recalling.

2. Approaches and methodologies

2.1   General Considerations

2.1.1   Through teachers' individual planning, mutual support and sharing of ideas, good and regular internal communications, proper management of resources and timetabling, and periodical school review we hope to provide all children with the opportunity to access the full range (all strands) of the mathematics curriculum.

2.1.2   *Textbooks* are in line with the content objectives for each class level. Textbooks reinforce the concept taught and give adequate practice in each activity. At the moment we use Busy at Maths (CJ. Fallon) from Junior Infants to 6th class. Online interactive websites and games are utilised where possible.

Maths Challenge is used for Mental Maths and Problem Solving and Figure it out is used as supplementary material.

Where a teacher deems it necessary supplementary materials will be designed /supplied

2.1.3 We have agreed to start as many lessons as possible with real life problems placing less emphasis and reliance on textbooks and more on active learning strategies.

2.1.4 As part of our emphasis on active learning strategies we will seek to have approaches and formulae
'discovered' by children rather than being taught by rote e.g. children identify the need for a standard unit of measurement, length x breadth = area etc.

2.1.5 In order to provide opportunities for all children from fourth to sixth class to use calculators, e.g. to check answers, to explore the number system, to remove computational barriers for weaker children or to focus on problem solving, each child has access to a calculator.

2.1.6 In all classes, we will endeavour to adhere to the number limits set out in the mathematics curriculum and emphasis will be placed on the development of the concept of place value.

2.1.7 In the Data Strand, pupils will be encouraged to collect real data from their environment and other areas of the curriculum and use it to represent their findings and draw conclusions.

2.1.8 Teachers will encourage the use of estimations skills in all relevant mathematics strands from infants through to sixth class. (Estimation skills for number can be found in the Teacher Guidelines: Mathematics pp.32-34

2.1.9 We will endeavour to raise the profile of mathematics as a subject to be enjoyed by all children by organising e.g. Mathematics Week, Displays of mathematics work in school, Mathematics Games Days etc.

2.2   Talk and discussion

2.2.1   *Guided discussion and discussion skills*

Discussion in mathematics is a serious and integral part of the learning process. Every opportunity will be provided to allow the pupils engage in discussion during mathematics lessons e.g. Teacher with class, Teacher with groups, Teacher with child, Child with child. Instructions will be given clearly, ideas carefully explained, questions posed skilfully and key vocabulary provided (see below: *Mathematical language in context)*. A conscious effort will be made to use the children's own ideas and environment as a basis for introducing/ reinforcing mathematical language. Pupils will be afforded opportunities to explain how they got the answer to a problem, discuss alternative ways of approaching a problem or give oral descriptions of group solutions.

2.2.2 *Scaffolding*

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

2.2.3 *Integration/ Linkage*

Areas in other subjects where mathematical processes are appropriate and useful (e.g. gathering data in history and geography, measuring temperatures in science), and thematic approaches both cross curricular and within the curriculum (linkage) will be identified and used. [See Teacher Guidelines: Mathematics pp. 52 - 57 for examples].

2.3 Mathematical language in context

There is a strong link between language and concept acquisition. We feel it is important to have a common approach to the terms used and the correct use of symbol names. This language has been agreed at whole school level in order to ensure consistency from one class to the next and also to help avoid confusion for children having difficulties with Mathematics. Our agreed strategies/language are as follows:

2.3.1 JUNIOR INFANTS:
No signs used

Addition:	Language: and, makes, add, is the same as, altogether makes

2.3.2 SENIOR INFANTS:
Introduction of signs: +, =
Vocabulary to match this: plus, equals (and, makes initially used as in junior infants)

$\begin{array}{r} 2 \\ +\ 1 \\ \hline 3 \end{array}$	**Top down:** 2 plus 1 equals 3 2 + 1 equals 3
2+1 =3	reads 2 plus 1 equals 3 or 2 and 1 makes 3

2.3.3 FIRST CLASS

Subtraction:	**- is introduced as a symbol in First class** Language: take away, less than, left
$\begin{array}{r} 16 \\ -\ 4 \\ \hline \end{array}$	Vertical: start from the top using the words 'take away' 16 take away four equals

5 – 1=	Horizontal: Read from left to right using the words 'take away' 5 take away 1 equals

PLACE VALUE: THE WORD 'UNITS' WILL BE USED RATHER THAN 'ONES' RENAMING/GROUPING WILL BE THE METHOD USED THROUGHOUT THE SCHOOL

2.3.4 SECOND CLASS

Addition:	
7+3+8= 18	7 plus 3 plus 8 equals 18 (7plus 3 equals 10 plus 8 equals 18)
6 3 <u>+6</u>	6 plus 3 plus 6 encourage 6 + 6 + 3
Subtraction	Language: subtraction, decrease, subtract, take away, from, less than, minus, difference
27 <u>-18</u>	7 take away 8 I cannot do so I change a 'ten' to ten units, 7+10= 17. 17 take 8 equals 9. 1 take away 1 leaves O.(rename two tens as one ten, then change a…….)

2.3.5 THIRD CLASS/ FOURTH CLASS
Rounding:
1, 2, 3 and 4 hey, ho, down we go
5, 6, 7 8 and 9 hey, ho up we go
Half way there which way we go?
Round me up hey, ho, ho.

Multiplication / Division	**÷ and x are introduced as symbols in Third Class.** The following vocabulary will be used: ÷ division, divide, divided by, split, share, shared between, group, how many in … X multiplication, multiply, times, of
Short multiplication	Start with 4 groups of 3 move onto… 4 threes 4 times 3 4 multiplied by 3 from bottom
Long	

multiplication	
Multiply by 10 **Multiply by 100**	from bottom Units first. Language as above. Add a zero Add two zeros
Division	Language: Divisible by/ not divisible by, share among
12 ÷ 4 ÷, , , all used	12 shared among 4 12 divided by 4
Fractions	
¼ of 32 7/2	Share 32 among 4 and/or 32 divided by 4 7 divided by 2 ½ is equivalent to 2/4 (4th class) ½ is the same as 2/4 ½ is equal to 2/4
Decimals	1/10 is equal to 0.1 1/100 is equal to 0.01 ***Include zero before decimal point***
Tessellation	Fit together with no spaces

2.3.6 FIFTH/SIXTH CLASSES

Number: **Multiplication/Division**	Language: square, prime, composite, rectangular numbers. Finding common multiples by listing numbers Finding common factors by listing factors The words 'product' and 'quotient' are introduced. Problems involving sum, difference, products, quotients
Fractions:	All children are taught tables of equivalent fractions ,decimals and percentages. Numerator, denominator
½ + ¼ =	$\dfrac{\_\_}{4} + \dfrac{\_\_}{4} = \dfrac{\_\_}{4}$
½ - ¼	$\dfrac{\_\_}{4} - \dfrac{\_\_}{4} = \dfrac{\_\_}{4}$

Mixed numbers + and – 3 ½ - 1 ¾ =	Add/Subtract whole numbers at first and then add and subtract the fractions.
Multiplication $\frac{1}{3}$ X $\frac{1}{5}$	Multiply top number by top number Bottom number by bottom number Simplify/ break down
Addition Subtraction Rounding decimals Multiplication of decimals Division by decimals Converting a fraction to a decimal	to 3 decimal places (with/without calculator) to 3 decimal places (with/without calculator) to the nearest whole number to 1 decimal place to 2 decimal places. Multiplying a decimal by a whole number Multiplying a decimal by a decimal Count the numbers behind the decimal points in the question and make sure that there are the same amount of numbers behind the decimal point in the answer. Multiply the divisor by 10/100 to change to whole number. If you multiply the divisor by 10/100 you must multiply the quotient by 10/100. You divide the numerator by the denominator (divide the top by the bottom) or if possible you change the number to tenths/ hundredths and then convert to decimal. Look out for ½, ¼, 1/5, 1/10, 1/100
Percentages Converting a fraction to a percentage	You multiply by a 100/1 or if possible you change the fraction to hundredths.
Time Addition Subtraction	Add minutes to minutes Hours to hours and simplify (changing minutes to hours) hrs. mins. hrs. mins. 3 15 2 75

	$\underline{-2 \quad\quad 33}$ $\underline{-2 \quad\quad 33}$ If minute's number is bigger on the bottom line, convert… Take hour and change to 60 minutes. Add to other minutes and rewrite sum.
Co-ordination	Introduce (x,y) axis Explain **x** comes before **y** in the alphabet. This will help them remember which comes first.
Area	*Rectangle/ square* Length x width (l x w). breadth = width Ares (1 Are = 100m^2, 1 hectare = 10,000m^2) Relationship of sq.m. to sq.cm. Area of room from scale plan *Surface area* Find the area of one face. Count the faces and multiply by no. of faces. Cube and Cuboid
Circle	Radius, diameter, circumference, arc, sector, Relate the diameter of a circle to its circumference by measurement. Measure the circumference of a circle using a piece of string. Construct a circle of given radius/diameter Examine area by counting squares.
Length	*Irregular Shapes* Look for regular shapes. Divide the shape and draw diagrams. Add areas a, b and c.
Lines and Angles	Right angle, acute, obtuse, reflex, straight, degrees, protractor, ruler
2D shapes	Sum of the angles in a triangle = 180 Sum of the angles in a quadrilateral = 360 Sum of angles in a circle = 360
3D shapes	Identify regular tetrahedrons, nets, construct

2.3.7 Tables
Number facts up to 10 will be memorised. Addition facts up to 10 will be memorised by the end of Second Class and multiplication facts up to 12 by the end of Fourth Class. Both will be revised up to the end of Sixth Class. Multiplication is a natural progression from extended addition e.g. 3 groups of 3, 4 groups of 3, 5 groups of 3 etc. Thus tables are recited throughout

the school as follows: 3x 3 = 9 (three threes nine), 4x3=12 (four threes 12), 5x3=15 (five threes fifteen). All teachers are expected to teach tables this way in order to ensure consistency and avoid confusion as children mover from one class to the next.

A variety of methods will be used including counting 2s, 3s, 4s …, reciting, using interactive games online etc. Subtraction and division tables will be learned as the inverse of addition and multiplication.

2.4 Active learning and guided discovery

We acknowledge the importance of concrete materials in the development of mathematical concepts for children in all classes. Each class is supplied with Maths equipment suitable for that class level. The class teacher is responsible for checking these resources at the end of the year. Maths equipment is stored in classrooms. Ipads are stored in an ipad trolley.

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2.5 Collaborative and Co-operative Learning:

The following learning styles will be employed: •Whole Class learning •Group activities •Peer teaching •Independent Learning

Skills needed to work as a group rather than just in a group (e.g. listening to others, turn-taking, appreciating that others' opinions are important), will be modelled, emphasised and reinforced. At all levels, activities will be guided by the teacher to enable the child gain valuable "hands-on "experience with security and support. Teachers will endeavour to use a variety of organisational styles where appropriate e.g. pair work, group work and whole class work.

2.6 Using the environment/community as a learning resource:

The school building is used as a resource to support the Maths programme. Teachers use the school environment to provide opportunities for mathematical problem solving e.g. numbers on doors, using hula hoops to sort children in PE, games on the playground, count trees in the playground, count windows, observe shapes of windows, doors etc.
Mathematical Trails are used indoors and outdoors to help teach mathematical concepts to children and make them aware of mathematics in their environment. Maths Eyes is also used in this way, as children use ipads to photograph mathematical aspects in the school environment. Children display their mathematical work in their classrooms.

2.7 Skills through content

The following skills will be acquired by the children through the study of the various strands in the Curriculum:

- Applying and Problem Solving

- Communicating and Expressing

- Integrating and Connecting

- Reasoning

- Implementing

- Understanding and Recalling

- Estimation

Every strand studied must provide opportunities for acquiring skills. Opportunities should also be provided for the transfer of these skills to other areas e.g. Science, Geography, and Music.

2.8 Problem Solving
Children are encouraged to use their own ideas as a context for problem solving. With regard to problem-solving children will be taught to apply the following strategies:
Understanding the problem

- Read the problem

- Read it again

- Say, in your own words, what you are trying to find out

- Find the important information

- Look for key phrases

- Write what you know

- The *Plan – Do – Review* model (Hohmann et al 1979) is a useful strategy.

Solving the problem

- Look for a pattern

- Guess and check

- Write an equation

- Break the problem down and solve each part

Additional Help

- Draw a picture

- Make an organised list or table

- Use objects to act out the problem

- Use easier numbers

- Work backwards

Answering the problem

- Use all the important information

- Check your work

- Decide if the answer makes sense

- Write the answer in a complete sentence

THE RUDE WAY OF SOLVING A MATHS PROBLEM: Children from 3rd – 6th classes, throughout the school may be encouraged to use the following abbreviated model for solving a Maths problem – **R**ead, **U**nderline the key words, **D**raw a diagram of the problem, **E**stimate your answer and then attempt to solve the problem. All children should be exposed to this model regularly and be very familiar with it by the time they reach 6th class

R.U.C.S.A.C. is similar and some teachers might find it more suitable to their class

2.9 Estimation
Estimation will form part of every Maths lesson. Children will be encouraged to use each of the following strategies selecting the most appropriate for the task in hand:

- Front end

- Clustering

- Rounding

- Special numbers

These strategies are explained on pages 32 – 34 of the Teacher Guidelines for Mathematics.

2.10 Presentation of work

There is an agreed approach to numeral formation in the junior classes. The rhymes or stories may vary but the formation is for example

- Straight down from the star

- Around from the star, then down, then straight

- Start at the star, then round and round

- Straight down from the star it goes, then across and put on its nose

- Go down from the star, around and put its hat on

- Start at the star then down we go, then all around halfway or so

- The star's on his nose, go across, then straight down to his toe

- Around and around and up it goes until his tail can touch his nose

- Start at the star and around I go, then down a stick handle down below

In all classes Maths work is presented using a number of formats namely:

Oral Presentation

- Teacher designed work sheets based on strand unit being taught.

- Work in class Maths Book which is an activity book

- Recording work.

- Using concrete materials.

Draw a picture, pictogram

- Number stories, Number rhymes (Junior classes)

- Birthday chart/ graph of favourite fruit/ colour etc.

A pencil only is used for writing numbers and problems in Maths right up until the end of 6th class. Children are allowed to use erasers. With regard to presentation of written work in senior classes copies will be ruled down the middle of the page except when exercise needs a full page eg graphs, diagrams etc.

3. Assessment and Record Keeping

Assessment is an integral part of our teaching and learning. In our school, the aims of assessment and record-keeping are to identify strengths on which to build when adapting the curriculum to suit individual pupil's performance and are important factors in documenting the continuity of a child's progress. All the strands of the Mathematics programme will be assessed and recorded. Students in all classes will use their scrapbook or S.A.L.F. folder to record samples of their work.

3.1 Assessment tools used by teachers:

- Teacher observation

- Worksheets and work in copies

- Assessment games

- Extension and enrichment activities based on the strand unit being taught. Samples can be seen in the Teacher's Manual, Busy at Maths.

- On-going teacher-designed tests. Busy at Maths end of tem assessment tests.Children will bring the tests and the results of such tests home for signing. Test results are kept by the class teacher and passed on to the next teacher.

- Oral tests (eg tables, continuation of number patterns, etc)

- Problem solving exercises that use a variety of mathematical skills

- Busy at Maths Termly tests for all classes.

- A Standardised Test (Drumcondra Primary Maths Test) is administered every year between the last week in May and the first week in June from Junior Infants - 6th class. The results are given to the Numeracy Co-ordinating Team (Mr. Clifford, Mrs. O' Donoghue, Mrs. R. Moynihan, Ms. Hallissey) and stored in the school in a secure environment .The results are also sent home as part of the end of year school report.

  The data accumulated will be assessed on a class by class basis and at a whole school level. The information gathered will be used to inform the focus of our SSE and SIP for t for the following school year 2019/2020. The school will continue concentrating on improving Numeracy standards, with continuing focus on Problem solving, in the Fossa NS.

Following assessment teachers may do the following:

- Give extra help to individual who need it

- Decide to increase time spent using concrete materials

- Discuss the situation with forwarding teacher at the end of the school year and beginning

of new school year

- Discuss concerns with parents and encourage parents to help children informally e.g. Give me 3 spoons, Help me set the table, How many doors? etc.

- Consult with the Special Needs team who will provide support when needed using available resources within the school.

4. Children with Different Needs

The Maths programme aims to meet the needs of all children in the school. This will be achieved by teachers varying pace, content and methodologies to ensure learning for all children. Teachers are cautious not to label children as having difficulties in Mathematics especially in Junior and Senior infants

Those children who receive scores at or below a Sten of 4 on the standardised tests will have priority in attending Support Teaching in Maths. The availability of Support Teaching for Maths however, depends on the case load of the Support Team (three fulltime support teachers and one part time). Arrangement will be in accordance with the recommended selection criteria as determined by the DES.

Class teachers of autistic children in both special classes will ensure appropriate Maths language is covered in class.

Children with exceptional ability in Maths will be given extra work based on the concept being taught in class. ICT allows children to work at their own level and challenges children of all abilities. Parents will be consulted and opportunities for further development will be explored i.e contact Centre for Talented Youth. Teachers will keep a record of the differentiated approach adopted for these children.

4.1   Catering for the weaker child/child with poor attention span, child who is underachieving

The following strategies may be of help to class teachers:
- Position the child's desk near the teacher. This will allow for regular reminders to stay on task and to give praise for work attempted so far.
- Keep desk clear of clutter to minimise fidgeting. Praise and reward as much as possible.
- Keep directions short and simple.
- Ensure the mathematics task is at an appropriate level.
- Keep the task short.
- Change the activity regularly.
- Colour coding and highlighting worksheet/blackboard may help.
- Provide materials at concrete level to represent number facts: unifix cubes, Dienes blocks, coins, number lines, hundred squares etc. Then proceed to representational [semi-concrete] level: tallies, pictures, bundles, score cards. Then finally move onto abstract symbols - +, x, %, fraction, decimal.

- Use less verbal elaboration in lesson; peer tutoring and cross-age tutoring can benefit both helper and learner roles greatly.
- Concentrate on teaching number facts and number relationships - e.g. 78 is "nearly" 80; 107 is "bit more than" 100.
- Link new math concepts and skills to existing knowledge. What do we already know about percentages? What do these sign mean - 25% off the sports ball.
- The same Mathematical Language and Methodology will be used throughout the school e.g. 7 - 3 will read 7 take 3.
- New terms to be introduced in mathematics should be taught thoroughly and not left to incidental learning.
- Periods of frequent revision are essential.
- Parents will be informed of the language in use.
- Provision may be made for extra informal parent-teacher meetings to keep parents informed of student's progress; what he/she is currently learning and any support that can be provided at home.
- Support Teacher and class teacher to have regular communication with each other in order to reinforce each other's work.
- Regular informal assessment **for** learning rather than of learning.

- Homework will be used as an opportunity for reinforcement of topics covered recently and in the past. Over-learning is essential for these children.

- Essential concrete materials have been made available in the classroom for Junior and Senior Infants. There is intended investment to equip all classes from 1st to 6th with essential concrete materials by June 2020.

4.2 <u>Activities for the less able child</u>

- Games are powerful motivators. They also encourage co-operation and turn-taking. Card games and dice games, magic squares, number line games, dominoes etc provide opportunities for reinforcing basic number facts in an enjoyable way. Older children can design their own board games. It is very important that materials used are age appropriate e.g. Coloured counters/interlocking cubes for younger students, Football cards/Euro coins for older students.
- Jobs which include counting can be made enjoyable and interesting. Children can be nominated to
  - Count out information notes for distribution to other classes
  - Counting children in the class – mark a chart for children absent/present
  - Count money for cake sales
  - Record temperature/rainfall on given days or for a period of time.

Use can be made of interesting mathematics internet sites   *Differentiated Teaching Strategies for Mathematics*
Teachers may change elements of the learning task to meet the different needs of all students.

Amount
Adapt the number of things the child is expected to complete, less tables to learn at a time, less sums on the page, 'do the first 5' rather than do the whole page. Do every second sum. Early finishers can go back and finish the ones they haven't done.

Time
Allow more time for certain students [overlaps a lot with the above] but could include extended timescale for completion of a project or a piece of work.

Support
Increase assistance at certain times of need, e.g. peer help at the beginning or as someone specific to ask questions of. Encourage child to use concrete materials, a rough work sheet, a calculator or a table book.

Input
Adapt the way you present the material - could you present the problem orally, visually or diagrammatically? Could you give a simple example as an illustration?, Could you 'drip feed' the work by giving it out a chunk at a time? Are you giving too many instructions at a time? Could you develop a routine for mathematics lessons e.g. always start with whole class mental arithmetic game to settle them down and have what's needed written on the board in advance or have a child in charge of sticking symbols on the board?

4.3 Children with exceptional ability

It is also important to consider the child who may be particularly good at mathematics.

a) He/she can be given more difficult or taxing problems to solve rather than prematurely pushing him/her forward, or the overuse of rote computational exercises.
b) Problems with two or more steps provide a challenge, or problems from the equivalent or next class level of another scheme.
c) Open-ended problems/projects.
d) Sequences of graded work-cards allow the children to work at their own pace and to undertake extension activities Provide problems which use the concept just taught, then get the children to make up a number of problems for their pals.
e) Extra board-games, dice games and dominoes
f) I.C.T.: Use of Mathematics websites and other Mathematics computer programmes.
g) These children can think, compile and make up their own board games.
h) Involve these children in more peer tutoring and general class organisation in Mathematics.

5. Equality of participation and access

In keeping with our school's ethos we will endeavour to ensure that every child regardless of ethnicity, sex, ability or any other consideration is given the fullest opportunity possible to engage with our Mathematics programme.

Organisational Planning

6.0 Time-table
   Currently our school policy for the academic year 2019/2020 allows staff to utilise a discretionary hour to the teaching of problem solving in Maths. In addition to the 4 hours allotted by the DES, this brings the total teaching time for Maths in Fossa School to 5 hours per week from 1st to 6th class

7. Homework

See the School Homework Policy which is synopsised in the Fossa National School Booklet for parents.

8. Resources and ICT

Calculators
From fourth class upwards children are permitted to use calculators alongside traditional paper-and-pencil methods. Calculators are particularly useful for handling larger numbers, to check answers, to explore the number system, to remove computational barriers for weaker children. They also allow the child to focus on the structure of the problem solving questions. It is important that the skill of estimation is developed along with the use of the calculator. Calculators should meet the following requirements:

- Keys should be of a reasonable size and have a positive click action

- They must have a display of at least 8 digits and be large enough for two or three children to see

- They should have a memory function

9. Individual Teachers' Planning

Teachers should base their yearly and short term plans on the approaches set out in this whole school plan for Maths. Work covered will be outlined in the Cúntas Míosúil which will be submitted to the principal.

10. Staff Development
Teachers are made aware of any opportunities for further professional development through participation in courses available in Education Centres or other venues. Skills and expertise

within the school are shared and developed through input at staff meetings. Some experienced teachers also demonstrate the teaching of aspects of Maths to N.Q.T's and subject to demand we will hold courses for teachers in school on various aspects of the Maths Programme.

11. Parental Involvement

Parents are encouraged to support the school's programme for Maths. Meetings for parents take place in November for all classes.. At these meeting parents will be informed of the Maths programme for the year. Particular attention will be drawn to:

- The importance of trial and error, estimation, the use of concrete materials and the role of calculators

- The school's approach to e.g. subtraction, division, calculations using fractions..

- The fact that Maths homework may be based on practical activities

- The use of the Homework Journals as a vehicle for two-way communication between teacher and parent on progress in Mathematics or other issues.

At Parent/Teachers meetings both teachers and parents are afforded this chance to discuss each individual child's progress in Maths and ways of assisting that progress. Parents and teachers are welcome to make individual arrangements to discuss matters of relevance at other times throughout the year.

Parents with particular expertise may be invited to address classes. Parents are invited to accompany field outings.

12. Community Links

If there are members of the community, agencies/organisations who could make a particular contribution to the mathematics programme they will be approached and their assistance enlisted (e.g. visit from a bank or credit union employee, shop manager etc. orienteering and mapping)

13. Success Criteria

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

- On-going assessment, formal and informal, will show that pupils are acquiring an understanding of mathematical concepts and a proficiency in maths skills appropriate to their age and ability.

- Implementation of the school plan will be evident in teachers' preparation and monthly reports.

- Teachers will know from their new classes in September that work/approaches as outlined in the plan have been covered by the previous teacher

- Inspectors' suggestions/reports

14. Implementation, Review and Ratification

Class teachers are responsible for the implementation of the Maths programme for their own classes. The post holder with responsibility for Maths supports the implementation of the Maths programme and is responsible for the distribution and monitoring of resources.

Progress made during the school year will be reviewed in June of each year and will be based on results of assessments across all classes and on teachers' views as to the effectiveness of the plan.

This plan was ratified by the Board of Management on the _12th November 2018__

The plan will be communicated to teachers and implemented in classes from September 2018

This plan will be reviewed in June 2019