

Maths

Title

Whole School Plan Maths

Rationale

Mathematic education enables the child to think and communicate quantitatively and spatially, solve problems, recognise situations where mathematics can be applied, and use appropriate technology to support such use. The Mathematics Curriculum emphasises the development of the child's estimation skills and problem-solving skills using examples which are relevant to the child's experience

Mathematics education should enable the child to think and communicate quantitatively and spatially, solve problems, recognise situations where mathematics can be applied, and use appropriate technology to support such applications.

The development of numeracy skills is central to the child's life both within and outside school. We believe that these skills are also important for educational and personal success in later life. If the child is to become an informed and confident member of society he/she must be enabled to deal effectively with the varied transactions of everyday life and make sense of the mass of information and data available through the media.

The purpose of this plan is to provide practical guidance for teachers, parents and other relevant persons on the provision of the effective teaching of mathematics in our school.

Vision

We envisage that in mathematics each child will be given the opportunity to develop their mathematical skills and competencies to their full potential and with the relevant supports in place. We aspire to create an enjoyable mathematical experience for the children where mathematics is seen in everyday life and not just in the classroom.

Aims

We endorse the aims of the Primary School Mathematics Curriculum

The aims of the primary mathematics curriculum are

- 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 recalling basic number facts

Curriculum

Early mathematical activities (Junior infants only)	Classifying
	Matching
	Comparing
	Ordering

Number	Infant classes Counting Comparing and ordering Analysis of number <i>Combining</i> <i>Partitioning</i> <i>Numeration</i>	First and second classes Counting and numeration Comparing and ordering Place value Operations <i>Addition</i> <i>Subtraction</i> Fractions
Algebra	Extending Patterns	Exploring and using patterns
Shape and space	Spatial awareness 3-D shapes 2-D shapes	Spatial awareness 2-D shapes 3-D shapes Symmetry Angles
Measures	Length Weight Capacity Time Money	Length Area Weight Capacity Time Money
Data	Recognising and interpreting data	Representing and interpreting data
Skills	Applying and problem-solving Communicating and expressing Integrating and connecting Reasoning Implementing Understanding and recalling	
	Third and fourth classes	Fifth and sixth classes
<i>Strands</i>	<i>Strand units</i>	<i>Strand units</i>
Number	Place value Operations <i>Addition and subtraction</i> <i>Multiplication</i> <i>Division</i> Fractions Decimals	Place value Operations <i>Addition and subtraction</i> <i>Multiplication</i> <i>Division</i> Fractions Decimals and percentages Number theory
Algebra	Number patterns and sequences Number sentences	Directed numbers Rules and properties Variables Equations
Shape and space	2-D shapes	2-D shapes

	3-D shapes Symmetry Lines and angles	3-D shapes Symmetry Lines and angles	
Measures	Length Area Weight Capacity Time Money	Length Area Weight Capacity Time Money	
Data	Representing interpreting data Chance	and Representing interpreting data Chance	and

All teachers are familiar with the strands, strand units and content objectives for their class levels. Curriculum objectives are at the core of each mathematics lesson, and teachers refer to the curriculum objectives in their own planning.

The content objectives are laid out on the following pages in the Curriculum Handbook.

Infant Classes pgs. 20-35

First and Second classes pgs. 40-58

Third and Fourth classes pgs. 64-83

Fifth and Sixth classes pgs. 88-111

Approaches and Methodologies

We will use a combination of the following approaches:

- Active learning and guided discovery
- Problem solving
- Collaborative learning
- Use of the environment
- Skills development through content

(See *Teacher Guidelines: Mathematics pp. 68-69*)

- **Applying and problem solving**, e.g. selecting appropriate materials and processes in science
- **Communicating and expressing**, e.g. discussing and explaining the processes used to map an area in geography
- **Integrating and connecting**, e.g. recognising mathematics in the environment
- **Reasoning**, e.g. exploring and investigating patterns and relationships in music
- **Implementing**, e.g. using mathematics as an everyday life skill
- **Understanding and recalling**, e.g. understanding and recalling terminology, facts, definitions, and formulae

Language – Concepts/ Skills

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 on the following pages:

JUNIOR INFANTS:**No signs used****Addition:**

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

SENIOR INFANTS:**Introduction of signs: +, =**

Vocabulary to match this: plus, equals (and, makes initially used as in junior infants)

2

+ 1

3

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

FIRST CLASS**Subtraction:****- is introduced as a symbol in First class**

Language: take away, less than, left

16

- 4

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**

(Following discussion and consultation between the SET team and ISM team it was agreed that if children reach third class and are still struggling with Place Value and subtracting with renaming/regrouping they will be taught the borrow and pay back method. The rationale behind this is that they will learn how to subtract and have success.)

SECOND CLASS**Addition:**

7+3+8= 18 7 plus 3 plus 8 equals 18 (7plus 3 equals 10 plus 8 equals 18)

6

3

+6

6 plus 3 plus 6

encourage 6 + 6 + 3

Subtraction Language: subtraction, decrease, subtract, take away, from, less than, minus, difference

27

-18

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 0.

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

Short

multiplication

Long

multiplication

÷ 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

Start with 4 groups of 3 move onto...

4 threes

4 times 3

4 multiplied by 3

from bottom

from bottom

Units first. Language as above.

Multiply by 10

Multiply by

100

Add a zero

Add two zeros

Division Language: Divisible by/ not divisible by, share among

$12 \div 4$

÷,

,

all used

12 shared among 4

12 divided by 4

Fractions

$\frac{1}{4}$ of 32

$\frac{7}{2}$

Share 32 among 4 and/or 32 divided by 4

7 divided by 2

$\frac{1}{2}$ is equivalent to $\frac{2}{4}$ (4th class)

$\frac{1}{2}$ is the same as $\frac{2}{4}$

$\frac{1}{2}$ is equal to $\frac{2}{4}$

Decimals $\frac{1}{10}$ is equal to 0.1 $\frac{1}{100}$ is equal to 0.01

Include zero before decimal point

Tesselation Fit together with no spaces

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 to MEMORISE TABLE OF EQUIVALENT FRACTIONS, DECIMALS AND PERCENTAGES (see attached)

Numerator, denominator

$$\frac{1}{2} + \frac{1}{4} = \underline{\quad} + \underline{\quad} \underline{\quad}$$

$$4 \times 4 = 4$$

$$\frac{1}{2} - \frac{1}{4} \underline{\quad} \underline{\quad} \underline{\quad}$$

$$4 \times 4 = 4$$

Mixed numbers

+ and -

$$3 \frac{1}{2} - 1 \frac{3}{4} =$$

Multiplication

$$1 \times 1$$

$$3 \times 5$$

Multiply top number by top number

Bottom number by bottom number

Simplify/ break down

Division of whole
number by fraction

$$5 \div \frac{1}{4} =$$

Change your whole number into a fraction and turn your second

Interactive board very

valuable resource in

teaching fractions

fraction upside down and multiply.

How many quarters in 5 units $5 \times 4 = 20$

Visual aids used by teacher 1 1

Decimals 1/10, 1/100, 1/1000 – tenths, hundredths, thousandths

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 the bottom)

or

if possible you change the number to tenths/ hundredths and
then convert to decimal. Look out for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{10}$, $\frac{1}{100}$

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

-2 33 - 2 33

If minutes 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, 1 hectare = 10,000m)

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

3D shapes

Sum of the angles in a triangle = 180

Sum of the angles in a quadrilateral = 360

Sum of angles in a circle = 360

Identify regular tetrahedrons, nets, construct

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: $3 \times 3 = 9$ (three threes nine), $4 \times 3 = 12$ (four threes 12), $5 \times 3 = 15$ (five threes fifteen). All teachers are expected to teach tables this way in order

to ensure consistency and avoid confusion as children move from one class to the next. A variety of methods will be used including counting 2s, 3s, 4s ..., reciting, using music tapes etc. Subtraction and division tables will be learned as the inverse of addition and multiplication.

Children from 2nd – 6th classes recite their tables regularly and tables are reinforced every day. Children are encouraged to memorise tables and tables are given for homework. Class teachers identify children having difficulties with tables and with them set realistic targets ensuring steady progression. These children will have their tables discretely asked every day and are rewarded when targets are met.

Assessment and Record Keeping

(See Curriculum pp. 114-121, Teacher Guidelines pp. 64-65)

Assessment is used by teachers to inform their planning, selection and management of learning activities so that they can make the best possible provision for meeting the varied mathematical needs of the children. The following are other 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
- Ongoing teacher-designed 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 (tables, continuation of number patterns, ...)
- Problem solving exercises that use a variety of mathematical skills
- ***The Sigma T standardised test is administered every year at the end of May from 1st - 6th class while teacher designed tests are used throughout the year.*** The results of each child's tests will be kept in their school file. Results of the standardised test are communicated to parents at the parent-teacher meetings. In accordance, with the numeracy and literacy strategy 0007/2012, standardised test results at the end of 2nd, 4th and 6th are made available to the Board of Management and the DES at the end of each school year.

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 the child in an informal way.
- Consult with the Learning Support Teacher who will provide support when needed using available resources within the school.

Differentiation

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.

Those children who receive scores at or below the 10th percentile on the standardised tests

will have priority in attending the SET team for supplementary teaching for Maths. The availability of supplementary teaching for Maths, however, depends on the case load of the SET team. Arrangement will be in accordance with the recommended selection criteria as determined by the DES. If a child is already attending the SET team for Literacy, it may be possible, on occasion, for the child to receive some help with his/her Maths work as part of the supplementary teaching sessions.

Children with exceptional ability in Maths will be given extra work based on the concept being taught in class and in our multigrade setting will be allowed to work with the next class level for the subject area of maths. 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. courses through DCU.

Teachers should keep a record of the differentiated approach adopted for these children.

ICT

Calculators

Calculators are used in our school as aid to the teaching of maths 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:

- If parents wish to buy a calculator they must ensure the calculator uses Algebraic Logic as opposed to Arithmetic Logic. Algebraic logic uses priorities in sequences of operation which we call BOMDAS (Brackets, Of, Multiplication, Division, Addition and Subtraction)
- 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 Maths software
- The use of maths software in conjunction with the use of interactive whiteboard is part of our strategy in the teaching of maths in each class.

Organisational planning

In accordance with the DES guidelines 2 hours 15 minutes is allocated to mathematics education in the infant classroom.

3 Hours is allocated to 1st- 6th class for mathematics education.

In accordance with the Numeracy and Literacy Strategy 0007/2012 an extra minutes a week is now allocated to the teaching of mathematics.

Discretionary time is used during the year to facilitate events such as Maths Week held in October each year and maths trails from time to time.

Resources

The current resources available to the children and staff for Mathematics Education are stored in the GP Room at Ballindaggin NS. The aim is to have appropriate amounts of resources for the teaching of hands on mathematics as mentioned in the approaches and methodologies section. The resources are reviewed annually and any purchases needed are made.

Linkage and integration

Every attempt will be made to link the various strands of the Mathematics curriculum and to integrate the other subject areas with Mathematics, where appropriate.

e.g. Maths and History – timelines, length and width of Titanic

Maths and Science – height and weight of various living things

Maths and Geography- mapping and scale

Extracurricular activity

Opportunities are provided for children to participate in and enjoy maths week in conjunction with the National Maths Week held in Ireland in October of each year. During this week, activities such as Problem of the Day, Calculator riddles, maths games, maths trails etc. are participated in.

Code of ethics

All teachers and coaches working in the school context will be expected to adhere to the school Child Protection Statement. They should always ensure that they treat children with integrity and respect and that the self-esteem of children is enhanced. Positive reinforcement and encouragement is an essential part of mathematics teaching.

Health and Safety

The children are required to use equipment such as trundle wheels, compasses, weighing apparatus etc. appropriately and carefully. Children must abide by the rules for outside mathematics activity such as trails. Should an accident occur in the Mathematics Education lesson we will follow the procedures outlined for accidents in our Health and Safety policy.

Individual teachers' planning and reporting

Individual teachers will design a mathematics education plan specifically for their own class while at the same time ensuring that their class plans coordinate with and feed into the overall school plan, set out in the policy. This should ensure clear progression as children move from class to class.

Strands covered in Mathematics Education each month are recorded on the Cúntas Míósúil.

The Cúntas Míósúil will be very relevant in recording what has been covered and in reviewing and developing the school plan for the following years.

Staff development

The school will access PDST Maths Support if necessary.

Teachers will be notified of courses relating to Mathematics Education available in the area.

Skills and expertise within the school are shared and developed through inputs at staff meetings and collegiate networking among teachers.

Parental involvement

Parents have a responsibility to support the schools policy for the teaching of mathematics. Information evenings will be held as the need arises for support for parents around new approaches to the teaching of mathematics so that they can be facilitated in supporting their children's development in mathematics.

- 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 used on practical activities
- The use of the Homework Journals as a vehicle for two-way communication between

teacher and parent on progress in Mathematics

Teachers and parents are afforded the chance to discuss each child's progress in Maths at P/T days. They can, discuss 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.

Community links

We are very much aware of the school's role in the community and we are also conscious of the fact that the expertise of people in the community is an invaluable resource to any school. Guest speakers or evening events around the teaching of mathematics may be held from time to time. Guest speakers may be open to the public during events such as Maths Week.

Evaluating the policy

Means of assessing the outcomes of the plan may include;

- Teacher/parent/community feedback
- Children's feedback regarding activity levels, enjoyment and skill development
- Results of standardised tests and appropriate analysis of these results
- Inspectors' suggestions/WSE recommendations

The criteria for evaluating the success of this policy will be :

- The development of skills and understanding in the area of mathematics
- The provision of opportunities for achievement for each child
- The level of teacher satisfaction in teaching a broad, balanced curriculum.
- The level of positive attitude towards the teaching of mathematics exhibited by the children

Ratification and communication

The Board of Management ratified this policy on the _____ of _____ 20____

Signed: _____ , (Chairperson, BOM)

The policy is available to view on the school website or a hard copy can be requested via the school office.