



St. David's B.N.S. / Scoil Daibheid Naofa

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Maths Plan

Aims

- To develop a positive attitude towards Maths and an appreciation of both its practical and aesthetic aspects.
- To develop problem solving abilities in the class and in 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 appropriate to his level of ability and development.

This plan has been drawn up by the staff to benefit teaching and learning in our school. The plan reflects the child centred approach which is central to the ethos of the school. Within this approach there is scope for differentiation so each child can fulfil his mathematical potential. We present our pupils with a carefully planned and coordinated curriculum that ensures sufficient opportunity for each student to acquire essential knowledge and skills, takes account of individual needs and meets the requirements of the Primary Curriculum. It is our aim that when a child leaves sixth class he/she will be able to recall basic number facts, think logically, solve problems, interpret data and have the required mathematical skills to enable them to reach their full potential.

It conforms to the principles of learning outlined in the Primary School Curriculum.

This plan was designed in order to:

- Review, consolidate, clarify and build upon aspects of existing mathematics plans
- Organise and coordinate work being carried out already by staff in mathematics
- Establish and provide a resource for staff members
- Provide a framework within which more specific planning can take place
- Provide information for Teachers, Parents, SNAs, BOM Members and all other interested educational partners of the school community.

This Mathematics plan will be addressed under the following headings:

Curriculum Planning

1. Strands and Strand Units
2. Approaches and Methodologies
3. Assessment and Record Keeping

Organisational Planning

4. Timetable/Homework
5. Resources and ICT
6. Individual teachers planning and reporting
7. Home/School Links

Curriculum Planning

1. Strands and Strand Units

Skills and Language Development

Skills Development for infant classes

Applying and problem solving

- select appropriate materials and processes for mathematical tasks
- select and apply appropriate strategies for completing a task or solving a problem
- recognise solutions to problems

Communicating and expressing

- discuss and explain mathematical activities
- record the results of mathematical activities concretely and using diagrams, pictures and numbers
- discuss problems presented concretely, pictorially or orally

Integrating and connecting

- connect informally acquired mathematical ideas with formal mathematical ideas
- recognise mathematics in the environment
- recognise the relationship between verbal, concrete, pictorial and symbolic modes of representing numbers
- carry out mathematical activities that involve other areas of the curriculum

Reasoning

- classify objects into logical categories
- recognise and create sensory patterns
- justify the processes or results of activities

Implementing

- devise and use mental strategies and procedures for carrying out mathematical tasks
- use appropriate manipulatives to carry out mathematical tasks and procedures

Understanding and recall

- recall and understand terminology

Language Development for Junior and Senior Infants

Strand	Junior Infants	Senior Infants
<u>Early Mathematical Activities</u>	Long, short, longer than, shorter than, more than, less than, same as, about the same as, enough, first, last	
<u>Number</u>	numbers 1-5, before, after, add one more, start at, zero, all together, total, counting on/all	first, second, third, last, numbers 1-10, count on, add, how many? estimate
<u>Algebra</u>	shape, colour, size, what comes next?	pattern
<u>Shape and Space</u>	over, under, up, down, on, beside, in roll, fit, round, not round, thick, thin	above, below, near, far, right, left, edge, corner, face straight, curved, flat, side
<u>Measures</u>		
<u>Length</u>	tall/short, wide/narrow, wider than	as long as, as wide as, longest, shortest
<u>Weight</u>	heavy/light, heavier, lighter, balance, weigh	weight, measure
<u>Capacity</u>	full, nearly full, empty, holds more than/less than/the same as	
<u>Time</u>	morning/evening, night/day, lunchtime, bedtime, early/late, days of the week, school days, weekends	Today, yesterday, tomorrow, seasons, soon, not yet, birthday
<u>Money</u>	buy, sell, spend, coins, cent/cents, names of coins up to 5 cent, how much?	cost, price, cheap/expensive, change, too much/ too little
<u>Data</u>	enough, more/less, as many as	sort, groups

Skills Development for first and second classes

Applying and problem-solving

- select appropriate materials and processes for mathematical tasks and applications
- apply concepts and processes in a variety of contexts
- select and apply appropriate strategies for completing a task or solving a problem
- recognise solutions to problems

Communicating and expressing

- listen to and discuss other children's mathematical descriptions and explanations
- discuss and explain mathematical activities
- discuss and record the results of mathematical activities using diagrams, pictures and symbols
- discuss problems presented pictorially or orally

Integrating and connecting

- connect informally acquired mathematical ideas with formal mathematical ideas
- recognise mathematics in the environment
- recognise the relationship between verbal, concrete, pictorial and symbolic modes of representing numbers
- carry out mathematical activities that involve other areas of the curriculum
- understand the mathematical ideas behind the procedures he/she uses

Reasoning

- classify objects into logical categories
- make guesses and carry out experiments to test them
- recognise and create mathematical patterns and relationships
- justify the processes and results of mathematical activities

Implementing

- devise and use mental strategies and procedures for carrying out mathematical tasks
- use appropriate manipulatives to carry out mathematical tasks and procedures
- execute procedures efficiently

Understanding and recalling

- understanding and recall terminology and facts

Language Development for 1st and 2nd classes

Strand	1st	2nd
<u>Number</u>		
<u>Counting and numeration</u>	read numbers 0-99	read numbers 0-199
<u>Comparing and ordering</u>	1 st -10 th	bigger than, smaller than, equal to, swapping, renaming, grouping
<u>Place value</u>	tens, units	hundreds
<u>Operations</u>	adding, twos, fives, tens, double, number line, hundred square, how many more? how many left, counting on/back, the same as	Threes, fours, sixes, add, take away, equals
<u>Fractions</u>	share equally, half	halves, quarters
<u>Algebra</u>	odd, even, pattern	number patterns
<u>Shape and Space</u>		
<u>Spatial awareness</u>	between, underneath, on top of, around, through, left, right	directions, half turns, quarter turns
<u>2-D shapes</u>	square, rectangle, triangle, circle, semi-circle, size, number and length of sides	oval, similarities and differences, halves and quarters of 2-D shapes
<u>3-D shapes</u>	cube, cuboid, cylinder, sphere	cone
<u>Symmetry</u>		line symmetry
<u>Angles</u>		half and quarter turns

Strand	1st	2nd
<u>Measures</u>		
<u>Length</u>	length, width, height, measure, nearly a metre, a bit more/less than a metre	centimetre, metre stick, trundle wheel, shortest, tallest
<u>Area</u>		cover
<u>Weight</u>	heavier, heaviest, lighter, lightest, balance, kilogram	half and quarter kilogram, pan balance, kitchen scales, bathroom scales
<u>Capacity</u>	pour, fill, full/empty, holds more than/less than/same amount as, litre	half, quarter litre
<u>Time</u>	hours and half hours on the 12 hour clock, egg timer, day before, day after, dates, months, year, calendar	quarter hour, digital clock
<u>Money</u>	up to 50 cents, change, exchange	up to 2 euro
<u>Data</u>	classify, represent	pictogram, block graph

Skills development for third and fourth classes

Applying and problem-solving

- select appropriate materials, concepts and processes for mathematical tasks and applications
- apply concepts and processes in a variety of contexts
- analyse problems and plan an approach to solving them
- select and apply a variety of strategies to complete tasks and projects or to solve problems
- evaluate solutions to problems

Communicating and expressing

- discuss and explain the processes used and the results of mathematical activities, problems, and projects
- listen to and discuss other children's mathematical descriptions and explanations
- discuss and record the processes and results of work using a variety of methods
- discuss problems presented verbally or diagrammatically and carry out analyses

Integrating and connecting

- connect informally acquired mathematical ideas and processes with formal mathematical ideas and processes
- understand the connections between mathematical procedures and the concepts he/she uses
- recognise mathematics in the environment
- represent mathematical ideas and processes in different modes: verbal, pictorial, diagrammatic, and symbolic
- recognise and apply mathematical ideas and processes in other areas of the curriculum

Reasoning

- make hypotheses and carry out experiments to test them
- make informal deductions involving a small number of steps
- explore and investigate mathematical patterns and relationships
- reason systematically in a mathematical context
- justify processes and results of mathematical activities, problems and projects

Implementing

- devise and use mental strategies and procedures for carrying out mathematical tasks
- use appropriate manipulatives to carry out mathematical procedures
- execute standard procedures efficiently with a variety of tools

Understanding and recalling

- understand and recall terminology, facts and definitions.

Language Development for 3rd and 4th classes

Strand	3rd	4th
<u>Number</u>		
<u>Place Value</u>	numbers 0-999, ordering, 3 digit numbers, hundreds, value, round whole numbers to nearest 10 or 100, one place of decimals	numbers 0-9999, 4 digit numbers, round whole numbers to nearest 1000, thousand, 2 places of decimals,
<u>Operations</u>	addition and subtraction facts, repeated addition, zero property, commutative and distributive properties, multiplication, counting in 2s, 3s, 5s, 10s, doubles, trebles, repeated subtraction, division, multiplication and division facts to 100, multiply and divide 1 and 2 digit numbers by a 1 digit number, remainder	multiply 2 or 3 digit numbers by a 1 or 2 digit number, calculator, divide a 3 digit number by a 1 digit number
<u>Fractions</u>	denominators 2, 4, 8, 10, fractions	denominators 3, 5, 6, 9, 12
<u>Decimals</u>	tenths	hundredths
<u>Algebra</u>	pattern in numbers 0-999, sequences, frame in number sentences	pattern in numbers 0-9999, translate one step word problems into a number sentence

<u>Shape and Space</u>		
2-D Shapes	Parallel, non parallel lines, shapes that tessellate or do not tessellate,	Equilateral, isosceles scalene triangle, parallelogram, rhombus pentagon, octagon
3-D shapes	Triangular prism, pyramid, number and shape of faces, ability to roll, slide or stack	sliced prisms
Symmetry	Lines of symmetry	horizontal, vertical, diagonal
Lines and Angles	Vertical, horizontal parallel lines, angles $>$ and $<$ a right angle	oblique, perpendicular lines, intersecting lines, acute and obtuse angles
<u>Measures</u>		
<u>Length</u>	Rename units of length in m and cm	Rename units of length in decimal and fraction form, perimeter
<u>Area</u>	Non-standard square units	Standard square units sq, cm, sq. m
<u>Weight</u>		Spring balance, markings on scales, renaming units of weight in decimal and fraction form
<u>Capacity</u>	millilitre 250ml, 500ml	markings on measuring containers, eg. 100ml, $\frac{1}{4}l$, $\frac{1}{2}l$, renaming units of capacity in decimal and fraction form
<u>Time</u>	daily, weekly, monthly, annual events in sequence, 5 minute intervals on analogue and digital clocks, timetables, rename minutes as hours and hours as minutes, read calendar	

Strand	3rd	4th
<u>Measures</u> <u>Money</u>	renaming euro and cents using symbols and decimal point, one step problems involving addition and subtraction of money	1 and 2 step problems involving the 4 operations
<u>Data</u> <u>Representing and interpreting data</u>	bar charts, simple scale,	line bar graphs incorporating scales 1:2, 1:5, 1:10, 1:100, simple pie charts
<u>Chance</u>	possible, impossible, might, certain, not sure, random	chance, likely, unlikely, never, definitely

Skill Development for fifth and sixth classes

Applying and problem solving

- select appropriate materials, concepts and processes for particular tasks and applications
- apply concepts and processes in a variety of contexts
- analyse problems and plan an approach to solving them
- select and apply a variety of strategies to complete tasks and projects or solve problems
- reflect upon and evaluate solutions to problems

Communicating and expressing

- discuss and explain the processes used and the results of mathematical activities, problems and projects in an organised way
- listen to and discuss other children's mathematical descriptions and explanations
- discuss and record the processes and results of work using a variety of methods
- discuss problems and carry out analyses

Integrating and connecting

- connect informally acquired mathematical ideas and processes with formal mathematical ideas and processes
- recognise mathematics in the environment
- represent mathematical ideas and processes in different modes: verbal, pictorial, diagrammatic and symbolic
- understand the connections between mathematical procedures and the concepts he uses
- recognise and apply mathematical ideas and processes in other areas of the curriculum

Reasoning

- make hypotheses and carry out experiments to test them
- make informal deductions
- search for and investigate mathematical patterns and relationships
- reason systematically in a mathematical context
- justify processes and results of mathematical activities, problems and projects

Implementing

- devise and use mental strategies and procedures for carrying out mathematical tasks
- use appropriate manipulatives to carry out mathematical procedures
- execute standard procedures efficiently with a variety of tools

Understanding and recalling

- understand and recall facts, definitions and formulae.

Language Development for 5th and 6th Classes

Strand	5th	6th
<u>Number</u>		
<u>Place value</u>	rounding whole numbers and decimals	rounding decimals to 3 decimal places
<u>Operations</u>	division of a 3 digit number by a 2 digit number	multiplication of a decimal by a decimal, division of a 4 digit number by a 2 digit number
<u>Fractions</u>	compare and order fractions with denominators 2-12, express improper fractions as mixed numbers, thousandths	common denominator,
<u>Decimals and percentages</u>	simple percentages 50%, 25%, 10%, simple discounts, increases	profit and loss, VAT, interest, increases, decreases
<u>Number Theory</u>	prime and composite numbers, factors, multiples	square numbers, square roots
<u>Algebra</u>		
<u>Directed numbers</u>	positive and negative numbers	positive and negative numbers on the number line
<u>Rules and properties</u>	brackets and priority of operations, rules for number sequences	
<u>Variables</u>		explore the concept of a variable in context of simple patterns, tables and formulae
<u>Equations</u>	translate number sentences with a frame into word problems and vice versa	translate word sentences with a variable into number sentences

<u>Shape and Space</u>		
<u>2-D shapes</u>	number of angles, type and number of sides in a variety of 3 and 4 sided figures, diameter, radius, tangrams	construction of triangles, circumference, co-ordinates
<u>3-D shapes</u>	tetrahedron, vertices	octahedron
<u>Lines and angles</u>	degrees, rotation protractor	quadrilateral
<u>Measures</u>		
<u>Length</u>	mm, km, perimeter	rename measurements as appropriate metric units, fractions, and decimals, scale on a map
<u>Area</u>		acres, hectares
<u>Weight</u>		rename measurements of weight as fractions or decimals
<u>Capacity</u>	graduated jugs	measuring volume of a cuboid in litres
<u>Time</u>	24 hour clock digital and analogue	international time zones,
<u>Money</u>	value for money	convert other currencies to euro and vice versa
<u>Data</u>		
<u>Representing and interpreting data</u>	multiple bar charts, statistics, averages	trend charts
<u>Chance</u>	possible outcomes, frequency charts and tables	

2. Approaches and Methodologies

To implement our school plan we will use the following methodologies:

- Talk and discussion
- Using estimation strategies
- Active learning and guided discovery
- Collaborative/co-operative learning
- Skills through content
- Problem solving- variety of problems
- Using concrete materials and the environment
- Integration of mathematics across all areas of the curriculum
- An agreed approach to numeral formation in the junior classes.
- A whole school approach to neat and careful presentation of work
- Variety of opportunities will be provided for recording work e.g. using ICT to record data, concrete materials for junior classes and using diagrams.
- A hands on approach using concrete materials and appropriate mathematical language will be used from Infants to 6th.

3. Assessment and Record Keeping

We see assessment as a continuous process ranging from classroom observation to standardised testing. This assessment should provide information and feedback that will enable teachers to cater for individual differences in ability, previous learning and learning styles.

A broad range of assessment tools will be used in mathematics including samples of a child's work, observation records, mastery check-list results and the results of both teacher designed tests and standardised tests.

Annual standardised testing will take place each year in May. This testing will be used to track individual progress, to identify areas which are proving challenging for the child and to provide feedback to the teacher and parents. The standardised testing will be organised, documented and maintained by the SEN Team.

In September the new class teacher will discuss these results with the class teacher who administered the test.

Organisational Planning

4. Timetable/Homework

A minimum of 3 hours and 25 minutes each week is allocated for the formal teaching of mathematics in infant classes and 4 hours 10 minutes in classes 1st to 6th as outlined in the Numeracy Strategy.

Homework in Mathematics will be in line with school policy. The work will be differentiated, taking into account the range of abilities within each class. Homework should be as reinforcement, as it offers an opportunity to widen experiences begun in the classroom, for example work with capacity or finding the area of a room. Homework encourages organisational skills and the ability to work independently.

Homework creates a link between home and school. It is important to communicate with parents about the correct terminology and methods being used by the children and to make homework assignments realistic, practical and relevant.

5. Resources and ICT

Each class has supplementary resources that correspond to their maths programme.

There is a central store of Mathematical equipment in the Room 4a. These resources are catalogued and available to all teachers. Class sets of calculators are available in Room 4a. When taking maths equipment from 4a each teacher needs to record: equipment taken, date taken and date returned.

Computer software is catalogued and on the school server, accessed through the computer room and classroom PC's.

The school environment will be used as a resource in areas such as measuring, shape, length and area.

Textbooks will be used to support the school plan in Mathematics. Currently we are using the Folens Planet Maths Programme throughout the school. This Programme has well developed interactive whiteboard resources available to support the Maths Programme.

6. Individual Teachers' Planning and Reporting

In line with the agreed school plan each teacher will do both long term and short term planning for Mathematics. Consultation between teachers is of great importance so that the needs of all children can be met.

Children with Different Needs:

Children with special needs will have access to all strands of the mathematics curriculum.

Teachers will tailor the Mathematics curriculum to make it accessible to all children.

Differentiation is used at every class level within the class.

The SEN team provides supplementary teaching in Maths for children identified with learning difficulties.

The availability of supplementary teaching for Maths depends on the case load of the Learning Support Team.

Children with exceptional ability:

The school will provide a range of strategies to provide challenges for children of exceptional ability such as- differentiated mathematics programme and the use of ICT to support their work.

Monthly progress reports will be kept by the Principal and are used to monitor the class progress through the strand and strand units. Teachers are made aware of opportunities for further professional development through participation in courses.

7. Home/School links

At the initial meetings for parents of the incoming Junior Infants, the importance of counting, sorting, matching etc with young children is discussed.

Annual parent/teacher meetings which allow for a discussion of individual children's progress in Maths will be organised.

Informal parent teacher meetings will be convened at the request of the teacher or parent in order to discuss concerns about a child's progress in Maths.

Communication between teachers and parents about the content of the maths programme and the methods being used is important. School and home will have a uniform approach to difficult areas such as subtraction. Assessment information /results on standardised tests are shared with parents in end of year reports and at the annual Parent Teacher Meetings.

Parents can help their children informally by encouraging the correct use of mathematical language and the use of number in everyday life. The importance of play and exploration with, for example sand, water, bricks and blocks can be highlighted.

Parents can provide useful information for the teacher about the child's early number or mathematical experiences. They will also be able to help the teacher's understanding of the child's attitudes to mathematics and his use of mathematics in daily life.

This plan will be reviewed as necessary by staff.