Oylegate N.S.
Mathematics Policy

1. Introduction.
This curriculum policy was drawn up over a two year period. All members of the teaching staff contributed to the school plan.

2. Vision.
It is our vision that the children of Oylegate N.S. will reach their full individual potential in the area of maths. We will endeavour to ensure that each child has the mathematical skills to live a full life, both as a child and an adult. We envisage that each child will leave the school with a positive attitude towards mathematics.

3. Aims.
1. To develop a positive attitude towards mathematics through interesting and meaningful experiences.
2. To enable the children to develop problem-solving abilities.
3. To develop an appreciation of the practical aspects of mathematics and to apply them to everyday life.
4. To enable children to use the mathematical language accurately and effectively.
5. To help the children acquire an understanding of mathematical concepts - appropriate to their age and ability.
6. To help the children to become proficient in mathematical skills and in recalling basic numerical facts.
7. To provide many opportunities to revise maths concepts before exploring new concepts.
8. To assess at regular intervals using a variety of methods.
9. To share resources, ideas and practice.
10. To ensure continuity of maths language and uniformity of teaching approaches

Content of plan

Curriculum

1. Strand and Strand Units

Strands	Strand Units
Early Mathematical Activities	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 (introduced in 3rd/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)

2. Approaches and methodologies

The following approaches and methodologies are used

- Concrete materials/manipulatives
- Talk and discussion
- Active learning and guided discovery

- Collaborative and co-operative learning
- Problem solving
- Use of the environment
- Estimation
- Textbooks and workbooks
- Calculators
- Tables
- Resources
- Integration

Concrete materials/manipulatives
A hands-on approach is essential if children are to understand mathematical concepts. They will need a wide variety of materials when exploring tasks. This is important right through to sixth class and will require access to a considerable amount of equipment. Available equipment will be listed later (Appendix 1). The use of concrete equipment will be necessary in all strands. Working with equipment can be done individually, in pairs or in groups, depending on the task. Mathematical games are used formally and informally to support and consolidate learning, i.e. matching, multiplication facts.

Talk and discussion plays an integral role in our maths lessons to develop mathematical concepts and language acquisition. We promote the accurate and effective use of mathematical language.
Talk and discussion is developed in our school through such activities as the following:

Junior Classes
- We emphasise and discuss maths related concepts in the home.
- We encourage parents to talk about everyday maths e.g. shopping, mealtimes etc.
- Maths language is developed through use of nursery rhymes, number stories and number songs.
- Through concrete materials and resources.
- Discussions on maths in the classroom environment.
- Children's literature e.g. 3 Little Pigs, Little Red Hen.
- Problem solving.
- The language in the strands.

Middle Classes
- Open and general discussions.

- Using the classroom environment.
- Developing estimation skills.
- Problem solving.
- Using the home environment for giving maths a real life meaning e.g. time, shape, measure.
- Maths concepts and games.
- Maths trail and children designing their own trail.

Senior Classes
- Using home environment, classroom, school environment and the wider world e.g. travel, money.
- Various types of problem solving..
- Maths games e.g. Countdown.
- Emphasise maths language in the strands.
- Open and general discussion.

Mathematical Language used in the teaching of the Number Strand.
We want to ensure that there is continuity of maths language and uniformity of teaching approaches used in the Number Strand, throughout the school. We feel that this is particularly important in the Number Strand as this is where use of different language could cause confusion.

JUNIOR INFANTS
No signs used

Addition:	Language: and, makes, add, is the same as, altogether, makes, plus
	Informal introduction of signs:+,-, =

SENIOR INFANTS

Meriel?	**Formal Introduction of signs: +,-, =** Vocabulary to match this: plus, equals (and, makes initially used as in junior infants)
2 + 1 3	**Bottom Up:** 1 and 2 makes 3 1 plus 2 equals 3
2+1 =3	reads 2 and 1makes 3

	2 plus1 equals 3

FIRST CLASS

34 +17	Addtition :Add the units first Put down the units and carry the ten. Now add the tens.

Subtraction:	- is introduced as a symbol in First class Language: take away, less than, left, rename
16 - 4	Vertical: start from the top using the words 'take away' 16 take away 4 equals Informally: 6units take away 4 units is 2, 1 ten take away 0 is 1
5 – 1=	Horizontal: Read from left to right using the words 'take away' minus, subtract , less 5 take away 1 equals Place Value: The word 'Units" will be used rather than "ones". Renaming will be the method used throughout the school.

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 the child to choose the easiest method to add the three digits e.g. 6+6+3
Subtraction	Language: subtraction, decrease, subtract, take away, from, less than, minus, difference
27	7 take away 8, I cannot do so I rename a ten, 7+10= 17. 17 take

-18	8 equals 9. 1 take away 1 leaves O.

THIRD CLASS/ FOURTH CLASS

Multiplication/ Division **Short multiplication** **(4th class) Long multiplication** **Multiply by 10** **Multiply by 100**	$\div$ and x are introduced as symbols in Third Class. The following vocabulary will be used: $\div$ 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 times 3, 4 multiplied by 3, 4 threes Start at the bottom When doing long multiplication children will estimate answers. Start with the bottom number. Multiply by the units first. Then multiply by the tens. Any renamed units go on the line to be added on. Children will have lots of practice in the commutative and distributive properties of multiplication. Add a zero Add two zeros
Division	Language: goes into, Divided by, divisible by, share among
12 $\div$ 4	12 shared among 4 12 divided by 4 4 into 12 goes
Fractions	
¼ of 32	Share 32 among/between 4 and/or 32 divided by 4 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*

FIFTH/SIXTH CLASSES

Number: **Multiplication/Division** **Division**	Language: square, prime, composite, rectangular numbers, square root, units, tens, hundreds, thousands, ten thousands, hundred thousands, rename, relationship, combine, split, compare Finding common multiples by listing numbers Finding common factors by listing factors.HCF, LCM The words 'product' and 'quotient' are introduced. Problems involving sum, difference, products, quotients. Times, groups of, remainder Children will have practice in division by 10, repeated subtraction, importance of estimation, front end estimation, find the remainder.
Fractions:	Numerator, denominator, improper, mixed numbers, equivalence, simplify, relationship
½ + ¼ =	__ + __ __ Use the same denominator 4 4 = 4
½ - ¼	__ _ __ __ Use the same denominator 4 4 = 4
Mixed numbers + and − 3 ½ - 1 ¾ =	Make sure the fractions have the same denominator. The process is based on equivalence of fractions. Do you need to rename a unit when subtracting? Make sure final answer is simplified
Multiplication 3x1/3 1 X 1 3 2	 Use of repeated addition X means "of", 1/3 of a 1/2, pupils will see a pattern emerge. Multiply numerator by numerator(multiply the top numbers) denominator by denominator (multiply the bottom numbers) Simplify/ break down
Division of whole number by fraction	5 ÷ ¼ = How many 1/4s are in 5? Pupils will see a pattern emerge. Rename the whole number as a fraction and turn the divisor upside down and multiply.

	How many quarters in 5 units <u>5</u> X <u>4</u> = 20
	Visual aids used by teacher 1 1
Decimals	1/10, 1/100, 1/1000 – tenths, hundredths, thousandths, order, decimal point, decimal place
Addition Subtraction	to 3 decimal places (with/without calculator) to 3 decimal places (with. without calculator) Pupils are directed to correctly align the numbers.
Rounding decimals	to the nearest whole number to 1 decimal place to 2 decimal places.
Multiplication of decimals	Multiplying a decimal by a whole number Multiplying a decimal by a decimal How many digits are after decimal point in the sum? Make sure there are the same no. in the answer
Division of decimals	Importance of estimation and alignment of decimal points in the answer.
Converting a fraction to a decimal	You divide the numerator by the denominator or if possible you change the fraction to tenths/ hundredths and then convert to decimal. Look out for ½, ¼, 1/5, 1/10, 1/100
Percentages expressing a fraction as a percentage	Percent, percentages You multiply by a 100/1 or if possible you express the fraction as a hundredth.

Active learning and guided discovery
We feel that a hands-on approach is essential if children are to understand maths concepts. This approach is important right through from Infants to Sixth class and will require access to a considerable amount of equipment. Working with

equipment will be done individually, in pairs or in-groups, and the allocation of the equipment will be organised on a school basis.

1. Use of concrete materials
2. Calculators
3. Information Computer Technology (ICT) e.g. maths websites
4. Games (dice, cards, dominos)
5. Teacher-designed tasks e.g. measuring and recording height

Collaborative and co-operative learning

Used to motivate children to learn and develop social skills e.g.

- Measuring and recording.
- Maths games.
- Sharing resources.
- ICT and calculator work.
- Pair work
- Buddy teaching
- Group work
- Station teaching

Problem solving.

Types of problem solving used in school:

- Real life problems.
- Word problems.
- Puzzles
- Maths games.
- Open problem solving – emphasising that there can be many ways of solving a problem.
- Maths trail.

Strategies for solving:

- Personalise story/problem.
- Visualise – draw it out.
- Act it out.
- Estimation.
- Solve simpler version.
- RAVE CCC (**R**ead, **A**ttend to key words, **V**isualise, **E**stimate, **C**hoose numbers, **C**alculate, **C**heck)
- ROSE (**R**ead the problem. Paraphrase the problem. Try substituting simpler numbers for larger numbers or decimals. This makes estimating

easier. **O**rganise the mathematical operations you will use. **S**olve the problem. **E**valuate your answer. Was it the best method? Does it match the estimate?)

- RUDE (**R**ead the problem. **U**nderline key words. **D**raw a picture or diagram. **E**stimate the answer.)

Use of environment.
We use the children's environment, their interests and experiences to construct maths concepts. We also use the school and classroom environment to make maths more real and interesting.
Some Maths activities which involve use of our environment include:

- Numbers on doors, car registration numbers
- How many rooms/ windows,
- Observe shapes, angles.
- Maths trails.
- Measuring - drawing 1 metre on playground with chalk,
- Maths work is displayed in classrooms.
- In our Green Schools Project we endeavour to integrate maths with many of our activities e.g. surveys, data representation for projects etc.

Estimation.
Estimation is a key skill in mathematics, and must be developed and refined so that guesses become more realistic and accurate. It allows children to make a quick appraisal of their whether their answers appear to be correct. Children will be encouraged to use the following strategies, selecting the most appropriate:

- Front end
- Clustering
- Rounding
- Special numbers

Textbooks and workbooks.
The Planet Maths programme by Folens is used throughout the school. These textbooks cover all the strand units in each class. Teachers also use the Prim-Ed problem solving books for extra problem solving work in their classes. Teachers do not rely completely on textbooks, and use active learning where possible.

Calculators.
Calculators are used from fourth to sixth class. Children will be taught how to use calculators but it will also be emphasised that calculators are no substitute for computational skills. Children will will be taught to make decisions about when it

is appropriate to use them e.g. for checking answers and for particularly large or intractable numbers.

Tables.

Tables are the foundation stone for success in mathematics, and must receive the appropriate attention.

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.

Pupils say tables like this: 1 time 4 is 4, 2 times 4 is 8, 3 times 4 is 12.

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 every night for homework. Teachers keep a record of tables that have been learnt and identify children having difficulties with tables and will set them realistic targets ensuring steady progression. These children will have their tables discretely asked every day and are rewarded when targets are reached.

Resources.

All mathematical equipment bought with school funds remains the property of the school.

The following sources and resources will be used for the teaching of mathematics. The list will be added to at the discretion of the teacher.

- Exemplars and ideas from Teacher Guidelines.
- Planet Maths maths programme
- Prim Ed New Wave Mental Maths 1st – 6th Class.
- Prim Ed Problem Solving series
- Wall charts.
- ICT software.
- Bingo and other such maths games.
- Maths equipment suitable for all strands.
- Counters and other sorting materials.
- Teacher designed tests and exercises.

Integration

Maths has great scope for integration in other subjects. Integration of maths in other subject areas helps reinforce mathematical concepts as well as establishing a 'real world' context. Elements of number, time and measures can be applied to many other subjects, and integration is used whenever possible.

Presentation of work.

Recording of maths work in infants is done in 2 centimetre squared copy.
From 1ˢᵗ class upwards, smaller copies are used unless particular difficulties arise.
In senior classes, the presentation of written work
In senior classes the presentation of written work in mathematics is as follows:

- Each page is to be divided into two categories/columns. An additional extra column can be added for rough work where necessary. The order of writing sums is to be written vertically down the page, as opposed to horizontally.
- A variety of options for presentation will be availed of where appropriate at teacher's discretion for example drawing pictures to show result, concrete materials, diagram, verbally etc.
- Pencil is to be used for all computational work.

Skills through content.
By modelling the key methodologies in our school plan we aim to develop the following maths skills through the content of the maths curriculum.

- Applying and problem solving.
- Communicating and expressing.
- Integrating and connecting.
- Reasoning/ estimating
- Implementing.
- Understanding and/with recalling.

3. Assessment and record keeping.
Assessment is very important and necessary to provide the teacher with continuous detailed information about the pupils' progress and can help the teacher design appropriate learning activities. To enable us to assess progress we use the following methods:

- Teacher observation.
- Teacher designed tasks and tests.
- The Sigma – T standardised tests.
- Planet Maths Assessment tests
- Samples of work i.e. worksheets, copies etc. kept in a folder.
- Assessment games

If a pupil scores at or below the 12th percentile on SIGMA -T the class teacher, principal and special education teacher liaise regarding the selection of pupils for supplementary teaching and the implementation of the Staged Approach. The Staged approach is further outlined in our Learning Support and Resource Teaching Policies.
Supplementary teaching may be provided by individual withdrawal teaching, small group teaching or In Class Support whichever is deemed appropriate for the pupils.
SIGMA-T tests are analysed to provide information for creating individual pupil Maths programmes.

We use the results of these tests:
- To inform our own teaching.
- To give valuable information to parents.
- To make referrals, if necessary.

4. **Children with different needs.**

Our Maths policy 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.

Continuous observation by the Infants' teacher is essential in order to recognise children with difficulties in mathematics. If pupils in Senior Infants or 1st Class are displaying difficulties, they will attend the Special Education Teacher for supplementary teaching in Maths. This is part of our Early Intervention programme which supports the classroom Maths programme.

Children with exceptional ability in Maths will be given extra work based on the concept being taught in class such as Maths Matters follow on activities, Folens Maths cards or ICT. 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 The Centre for Talented Youth. Class teachers of *New Irish* children and children from the travelling community

will ensure appropriate Maths language is covered in class.

Teachers will keep a record of differentiated approaches adopted for children.

5. **Equality of participation and access**

Our Maths policy aims to ensure that all children have equal participation in and access to our mathematics programme.

Equal opportunity is given to boys and girls to access all parts of the curriculum.

Pupils whose first language is not English will be given extra help within the school and have access to language classes.

Children with special needs will be catered for to the fullest possible extent.

Organisation

6. **Timetable**

Junior/Senior Infants   2 hours 15 mins per week

1st – 6th Classes   3 hours per week

Withdrawal of pupils for supplementary teaching

It is important that there is collaboration between class teacher and resource/learning support teacher so as to ensure the child is not consistently absent for maths instruction. Where the child is receiving additional support in maths it is agreed that many of these children following separate individual programmes and that it is not essential that they attend the formal class instruction.

In a multi-class situation (2 classes), it is agreed that the teacher will teach the whole class and would then assign different activities geared at the varying levels of ability. Further extension of the lesson could proceed with the senior of the two classes.

7. **Homework**

Homework is based on the concepts and content covered in class. Homework allocated should take account of the differing levels of ability in the class and should be a positive experience for all. Maths homework will generally involve

both a written and oral element i.e. computation/problems and tables/mental maths. Practical activities should be given from time to time (e.g. measuring) bearing in mind the age and level of the class. Time should be given for the correcting of the maths homework and an opportunity to discuss any problems that arose

8. Resources and ICT

There is an Internet connection in each classroom and the pupils under the supervision of an adult can use the Internet to enhance learning in mathematics. We find the following websites to be useful in improving maths skills:

- Planet Maths
- Mangahigh
- Woodlands Maths Zone,
- Kidsnumbers.com
- Mathplayground.com
- Coolmath4kids.com
- Mathsisfun.com
- Bbc.co.uk/schools/numeracy.

9. Individual teachers' planning and reporting

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 Cuntas Miosuil which will be submitted to the principal.

10. Staff development

An atmosphere of open communication exists between all the staff members and ideas and expertise is shared. Discussion and planning in class groupings is encouraged.
Teachers are informed of maths related courses and encouraged to attend. Information acquired on these courses is made available to other staff members. Time is allocated at staff meetings for the discussion of maths related business when necessary.

11. Parental Involvement – Home School Links

The school recognises the importance of parents in a child's education and welcomes their involvement in the implementation of the mathematics programme.

Such involvement could be as follows:

- A letter to infant parents with examples of number formations and recommendations on how to develop their child's mathematical awareness through everyday activities is provided

- Parents are encouraged to supervise and be involved in maths homework.

- From time to time, maths related articles are included in the school newsletter.

- Annual parent teacher meetings provide maths assessment information. Further meetings could be arranged at the request of the parents or teacher.

- Annual written reports are forwarded to all parents in June of every year. These provide details of the child's progress in maths.

12. Community Links

Members of the local community may be invited to assist with the school's mathematics programme. Proposed invitations must be discussed in advance with the principal.

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

Implementation

(a) Roles and responsibilities

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

(b) Timeframe

This policy is effective from the date of ratification by the Board of Management.

Review
(a) Roles and responsibilities

The principal will consult with the In School Management team and the staff to determine a review date.

(b) Timeframe

The policy will be reviewed within five years of the ratification date.

Ratification and Communication

The B.o.M. will ratify the policy after consultation and feedback from itself has been received.

The policy will then be posted on the school website, and will also be available in hard copy format in the office.

Ratified by the Board of Management: _____

Signed: _____

(Chairperson, Board of Management)

Appendix A

Capacity
Measuring containers: includes science beakers, funnels & conical flasks etc.
1 x measuring volume kit

Chance
5 x jumbo packs of playing cards
30 x small playing cards
4 x large sponge dice
1 probability kit
72 x small dice

Length
7 x meter sticks (in a bin)
Lollipop sticks in sorting box
Matchsticks in sorting box
12 x trundle wheels (in a bin)
20 x Wind out tape measures (separate box)
x Cuisenaire rods 1cm multipack
Unifix cubes in each classroom

Money
Boxes of euro coins & notes

Multiplication
x Thunder bolt run (division & multiplication game)
3 x chute multiplication cards

Place Value/Number
1 x walk along number line (infant room)
1 x numbers play mat 1-20 (infant room)
1 x multi base 10 set (separate box)
1 x number line activity centre
30 x Calculator with container (separate box)
8 x Place value flip chart ..2 types (separate box)
1 x numicon (resource room)
8 x abacus (separate box)

Patterns
Infant Rooms

- sets of animals ,bears, dinosaurs, camels & shapes of different sizes & colours with activity cards (also suitable for patterns, classifying & matching)
- unifix cubes in all classrooms
- pegs & pegboards

Resource room:
- sequencing camels for pattern /matching sorting

The sorting box:
- 3 boxes of Coloured lollipop sticks
- 3 boxes of coloured match sticks
- lots of shapes in the shape boxes

Fractions, Decimals and Percentages
4 Teacher equivalence flips
1 Pupil's equivalence flips
10 fraction cube walls
4 x place value flip chart
Magnetic fraction wall in purple transparent folder
2 x fraction dominoes
1 x percentage dominoes
Chute games:
Doubles or halves
Problem cards

Shapes
Lots of sets of plastic 2 d (2 separate boxes)
Lots of sets of 3 d shapes (1 separate box)
Shapes net form in 3 d box above
31 geoboards & 6 x Elastic band packs
(In two separate boxes)

Sorting
Infant rooms
- sets of animals ,bears, dinosaurs, camels & shapes of different sizes & colours with activity cards (also suitable for patterns, classifying & matching)
- 8 sorting trays
- unifix cubes in all classrooms

Resource room:

- sequencing camels for pattern /matching sorting

Sorting box:

- 3 boxes of Coloured lollipop sticks
- 3 boxes of coloured match sticks
- lots of shapes in the shape boxes

Symmetry
Symmetry dominoes

The Circle
2 large protractors
Teacher protractor set
Class set of protractors
Class set of compasses
1 compass with bow
Lots of circular shapes in the different shape boxes

Time
Box 1:
1 x I minute sand timer
1 x 3 minute sand timer
55 x different types of small clocks
Box 2:
3 x large clocks
1 x teaching clock faces
1 X 60 second jumbo timers
3 x analogue / digital clocks

Weight
7 x different types of weighing scales (in two separate boxes)
6 x Balances (including individual sets of weights)
6 sets of weights (in a separate boxes)

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