Whole School Plan for

MATHEMATICS

of

Tramore Educate Together National School

Mathematics

Introductory Statement and Rationale

This policy is a record of practice in our school regarding teaching and learning in the area of Mathematics and was informed by the Curriculum Statements and Curriculum Guidelines, needs of the children and the expertise and experience of the staff of Tramore ETNS.

Rationale:

- To put in place a structured approach regarding content and methodologies for the teaching of mathematics in our school.
- To harmonise and coordinate the efforts and strengths of pupils, teachers and parents regarding the teaching and learning of mathematics.
- To give the child a *language* and a *system* through which they may analyse, describe and explain a wide range of experiences, make predictions and solve problems.
- To adopt the philosophy of constructivism.

Constructivism is a philosophy, which is central to our mathematics curriculum at primary level. It is the theory that all mental activity is constructive, i.e. children acquire new knowledge through an active process of assimilation and accommodation. They generate their own mathematical truths for themselves, and their own pace by the guidance of the teacher who offers them appropriate tasks and opportunities for discussion. A Constructivist approach to mathematical learning involves the child as an active participant in the learning process. The philosophy will inform the teaching staff of Tramore ETNS in their planning for their teaching of Mathematics.

This plan will form the basis for teachers' long and shortterm planning. It will also inform new and temporary/substitute teachers of our approaches and methodologies and familiarise them with resources currently being utilised.

Vision and aims

The Maths Plan recognises and endeavours to adopt the values that are set out in the ethos of the school. It attempts to support and sustain a harmonious environment in which potential is nurtured through the co-operation between staff, pupils, parents, board members and all other relevant parties.

The school ideally hopes to achieve the aims and objectives set out in the curriculum for Maths by introducing this plan.

We endorse the aims of the Primary School Curriculum for mathematics:

- 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

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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
4. Children with different needs
5. Equality of participation and access

Organisational planning

6. Timetable
7. Homework
8. Resources and ICT
9. Individual teachers' planning and reporting
10. Staff development
11. Parental involvement
12. Community links

Curricular Planning

1. Strand and strand units

All teachers are familiar with the strands/strand units/content objectives for their class level(s). Teachers refer to them regularly when planning for their classes ensuring all strands and strand units are covered.

Continuing Professional Development courses are encouraged and supported insofar as is possible by the Board of Management and the Principal. In the event of teachers changing class/classes or if new teachers join the staff, the Whole School Mathematics Plan is available for viewing in the office and online.

2. Approaches and methodologies

2.1 General

- All children should be provided with the opportunity to access the full range i.e. all strands, of the mathematics curriculum. Children in mainstream classes are exposed to a variety of teaching approaches and methodologies e.g. guided discussion and discussion skills, using a hands-on approach, developing the accurate use of mathematical language, cross-curricular approaches etc. Children receiving supplementary teaching from the learning-support/resource teacher experience all strands, while focussing on number strategies, mental maths and social maths e.g. time and money.
- We 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.
- We endeavour to ensure that the number limits are being adhered to, particularly at first and second classes where the emphasis is on the development of the concept of place value, e.g. more work within the hundred square without going past 100. For further information, refer to TG p. 70. Occasionally, the parameters may vary, depending on individual children.
- It is agreed that all efforts are made that the children would 'discover' formulae rather than being taught by rote, e.g. length by breadth. It is, however, recognised that rote learning may occasionally be required to support this.
- Simple fraction families are emphasised in the senior classes.
- Pupils collect real data in other areas of the curriculum and use it to represent their findings i.e. are they using data from other subjects such as geography, history or science to find the answer to a question.

- Estimation skills are developed and refined with the emphasis on using estimation in all areas of mathematics e.g. using estimation in measures, shape and space, data and not just in number.

- There is consensus among the staff in relation to the use of estimation strategies in number. A variety of strategies are used e.g. the front-end strategy, the clustering strategy, the rounding strategy and the special number strategies e.g. doubles/near doubles. For further information, refer to TG pp. 32-34.

- We hope to raise the profile of mathematics as a subject to be enjoyed by all children, e.g. mathematics fun days, display of mathematics work in school, Maths Monday homework (board games/cards/ICT), maths trails.

2.2 Active Learning / Guided discovery

Guided discovery

- We ensure that there is less emphasis and reliance on textbooks and workbooks and more on active learning strategies by focusing on Brüner's Theory of Learning i.e. Concrete to Pictorial to Symbolic maths.

- Children will have access to and use a broad range of mathematical equipment in order that mathematical concepts can be consolidated through investigation and play. (see Appendix 2 for a list of shared resources

- Children are provided with structured opportunities to engage in exploratory activities under the guidance of the teacher to construct meaning, to develop mathematical strategies for solving problems and to develop self-motivation in mathematical activities. 'Maths for Fun' also reinforces active learning and is a strategy used by the school with the help and support of parents. (Maths Monday)

2.3 Talk and discussion

Guided discussion and discussion skills

- Talk and discussion are seen as an integral part of the learning process and opportunities are provided during the Maths class for children to discuss problems with the teacher, other individual children and in groups.

- Teachers engage in focused discussion to introduce the lesson and to model mathematical language. Individual and group discussion occurs throughout lessons.

- Opportunities are provided for pupils to explain how they got the answer to a problem, discuss alternative ways of approaching a problem and/or give oral descriptions of group solutions.

- The maths lesson finishes with child led discussion of what they learnt with a focus on the mathematical language specific to what was learnt.

Integration

- The mathematical processes are appropriate and useful in other subjects e.g. gathering data in history and geography, measuring temperatures in science.
- Opportunities where a thematic approach could be used across a number of subjects include, the Olympics, the television, school trips, the Global Village, the post etc. See TG pp. 53 and 57 for examples.

Linkage

- Opportunities where a thematic approach might be used for linkage include when dealing with decimals are we also aware of their use in data - pie charts; measures - all areas but particularly money for introducing decimals. For further information, refer to TG pp. 52 & 56.

Mathematical language in context

- There is an agreed emphasis on the language of mathematics i.e. for each class level we have a list of terminology, language. *(See Appendix 1)*.
- There is a conscious effort made to use the children's own ideas and environment as a basis for reinforcing mathematical language e.g. you are taller than he is, teacher's table is longer/wider than yours.
- Common approaches to the language are used in
    - Addition – total, sum of, add, and
    - Subtraction – minus, subtraction, take-away, difference, less than
    - Multiplication – times, product of, multiply, groups of
    - Division – divide, share, split, groups of
    - Equals – same as, is, will be, answer is, means, makes

For further information, see Appendix 1. Although this identifies particular terms to be used at different class levels, care must be taken that children, during their school career, are exposed to the different terms used in relation to the symbols e.g. +, add, plus.

Number facts

- We use consistent language in the initial teaching of number facts, but we know that children will need to be aware of alternative language used. Our common approach to the initial teaching of number facts (tables) is,

  e.g. for 2+1, we say two plus one;

  for 9-6, we 9 take (away) 6;

  for 3 X 4, we say three times four;

  for $14 \div 7$, we say fourteen divided by seven; for =, we say equals.

- Children are aware of the commutative properties of addition and multiplication tables and of their relationship with subtraction and division.

- We teach subtraction and division tables separately to addition and multiplication and link them afterwards.

2.3 Active learning and guided discovery

- There are agreed strategies for teaching:
  - Addition - top to bottom
  - Subtraction - use of materials and decomposition (transition boards & Dienes blocks, unifix); start at the top.
  - Multiplication - vertical/horizontal presentation, skip counting, using mental strategies such as identifying doubles, near doubles, multiplying by 5 and 10, using games to reinforce facts, developing and honing estimation skills (*3rd-6th class*).
  - Division - concept of sharing, understanding division as repeated subtraction, developing and honing estimation skills (*3rd-6th class*). It is the opposite of multiplication.
  - We add and subtract fractions using the Lowest Common Denominator strategy (L.C.D.) (4th-*6th class*).
  - Hours and minutes are added/subtracted in separate columns.

- The children are encouraged to develop personal benchmarks, particularly in the measures strand, e.g. noting their height in relation to a metre, the width of their finger as close to a centimetre.

- The mathematical games in use at each level are as follows:

    - *Infants:* matching, sorting, classifying, memory games, dice/spinner games, card games.

    - *1st-2nd class:* memory games, tables games, matching, sorting, card games, dice games, dominos, number line games, spinner games.

    - *3rd-4th class:* memory games, tables games, card games, dice games, dominos, ICT games, online games, loop cards, sum races, maths trails.

    - *5th-6th class:* memory games, tables games, card games, dice games, dominos, ICT games, online games, loop cards, sum races, maths trails.

These are not exhaustive lists and teachers may add to or substitute games depending on the class level at the teacher's discretion.

The games are used to support particular areas of mathematics, though may lend themselves to linkage and integration throughout the curriculum. The children are familiar with how to play them and clear about when they have access to them.

2.4 Collaborative and co-operative learning

- Steps are taken to ensure that children learn the 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. There are opportunities provided for children to learn from their peers, e.g. working in pairs/small groups, older children 'teaching' younger ones.

- Teachers use a variety of organisational styles to encourage co-operative and collaborative learning, such as pair work, group work, whole class work, 'buddying'. The use of ICT such as the Interactive WhiteBoard, ipads and computers also support collaborative and co-operative learning.

2.5 Problem-solving

- Children are encouraged to use their own ideas as a context for problem-solving by talk & discussion, questioning & answering and through creating their own problems orally,

graphically and written *e.g. my mammy bought a 2 litre bottle of orange for the party yesterday – was it cheaper than two 1 litre bottles.* Children will be taught to apply the following strategies from Infant level:

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

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

Strategies for 1st and 2nd classes onwards

- R.U.D.E
- As the children begin to encounter written maths problems they are encouraged to use the abbreviated R.U.D.E. model for solving a Maths problem – Read, Underline the key words, Draw a diagram of the problem, Evaluate. While all children should be exposed to this

model regularly and be very familiar with it by the time they reach 2nd class, we are aware of variety of literacy abilities within the class setting.

- There is agreement on using strategies such as RUDE* and BOMDAS* to support children's problem-solving strategies. It is not essential to choose only one but teachers are aware of those in use, particularly those working with children with special needs:

*RUDE – Read, Underline, Draw, Evaluate

*BOMDAS – Brackets, Of, Multiplication, Division, Addition & Subtraction

These are just variations and teachers can easily construct their own to suit their circumstance.

- In making problem-solving more accessible and realistic for children, teachers are using checkable answers or using a calculator for larger numbers as part of their programme. Calculators are used from 4th class on.

- We provide opportunities for all children, Infants to Sixth class and including those with special needs, to have the opportunity to experience problem-solving activities e.g. by giving oral problems; by having them use objects to solve the problem; by using smaller numbers; by using items in the environment, e.g. how many beads can I hold in one hand - a little, a lot, more than teacher.

2.6 Using the environment

- We use the school environment to provide opportunities for mathematical problem-solving e.g. putting numbers on doors; marking heights on wallchart which can be used for comparison; having a mathematics facts board (Did you know?) to which children can contribute; having maths vocabulary around the school; using timer during other curricular areas; using the clock and calendar; using dice in PE; set number of laps to run; using hula hoops for sorting, classifying.

- Mathematical trails will be developed within and outside of the school building, in line with the school's Health and Safety policy.

- We give children opportunities to present/display their mathematical work in the class/corridor/school, web site, open days etc.

2.7 Skills through content

- Teachers make sure that skills are being actively developed through the 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.
- **Estimation**

- All classes encourage the use of mental mathematics. (See PCSP website www.pcsp.ie)

2.8 Mental Mathematics:

As part of our whole school strategy every Maths lesson will involve at least 5 minutes oral/mental number work. The mathematical language used for these lessons will be based on the R.S.G maths programme so that as children transfer through the school, they will be accustomed to the same mental number work, using the same language. Parents will be encouraged to do the same mental maths work at home.

Children in first class will concentrate on learning addition facts up to and including 12+12 tables in school.

Children in second class will revise addition tables and learn subtraction tables as part of homework.

Children in third and fourth class will revise addition and subtraction tables and they will learn multiplication and division tables as part of homework.

Children in fifth and sixth class will revise addition, subtraction, multiplication and division tables as part of homework.

Class teachers will assess and monitor children's progress and identify any children having difficulties with tables and set them realistic targets thus ensuring steady progression.

2.9 Presentation of work

- There is an agreed approach to numeral formation in the junior classes.
- There is a whole-school approach to presentation of written work (*see Appendix 3*).
- We provide a variety of options for recording work e.g. drawing a picture to show the result; using ICT; using concrete materials to demonstrate how the result was obtained; using a diagram; telling/explaining.

3. Assessment and record keeping

- The staff look at results on both a class and school basis to see if there are areas of mathematics that can be improved.
- There is an agreed whole-school approach to assessment in mathematics. We have agreement on:
    - Ensuring there is continuity and progression from class to class through discussion at the staff meeting in June and at other staff meetings as the need arises. Informal meetings also take place between teachers to discuss this.
    - Formative assessment tests are given to all classes. However, it is expected that the older classes i.e. 1st-6th would engage in regular monthly/termly assessment tests.
    - Informal formative assessment takes place throughout the day through teacher observation and questioning, teacher-designed tasks, work samples, portfolios and projects.
    - Standardised tests (Sigma T) take place annually from 1st to 6th class. These take place in May each year and are administered by the class teacher, with the aid of the Special Educational Needs (SEN) Team. The Middle Infant Screening Test is administered in February of Senior Infants.
- We ensure that a broad range of assessment tools are being used:
    - Teacher observation
    - Teacher-designed tests and tasks
    - Work samples, portfolios and projects
    - Child self-assessment
    - Diagnostic tests (mainly resource/learning-support)
    - Standardised tests
- We ensure that standardised tests are being used in accordance with instructions given with the test. Each teacher must consult and adhere to guidelines from appropriate manuals
- The information gathered during assessment is used to help inform parents of progress, inform class teachers of areas of concern and to identify those in need of further support from the learning support teacher.
    - Standardised assessment information shared with parents on the annual report cards. They are informed of regular formative assessment at parent-teacher

meetings and/or informal meetings. They are informed in time that a child needs help and they are guided on how to give that help at home.

- Feedback is given to children after an assessment in their copies. The teacher may provide general whole-class feedback. Also, a teacher may speak to an individual child in-class to provide feedback. Feedback should encourage them to see assessment as a positive experience which helps them to ascertain progress and identify the steps that need to be taken.

- Teachers will hold a pupil conference with each pupil at least once to discuss the pupil's progress from 4th class – 6th class.

- Records are managed and stored in line with the school's policy on record keeping.

4. Children with differing needs

Children with learning difficulties

(Refer to school's SEN Policy)

- Strategies used by teachers to ensure the participation of children with special needs in relation to mathematics include members of the SEN Team working in-class through co-teaching, consultation with the resource teacher, use of concrete materials, calculators etc.

- Teachers in mainstream classes provide a differentiated programme to cater for children with learning difficulties. This may involve varying pace, content and methodologies to ensure learning for all children.

- Children who receive scores at or below the 12th percentile on the standardised tests will have priority in attending/accessing the Learning Support teacher for supplementary teaching for Maths. The availability of supplementary teaching for Maths, however, depends on the case load of the Learning Support teacher. Arrangement will be in accordance with the recommended selection criteria as determined by the DES.

- Children with special needs are provided with access to all strands of the mathematics curriculum, though particular emphasis is placed on number and social maths as the needs require.

- There a collaborative approach in devising :

  - Individual Profile and Learning Programmes (IPLPs) for pupils who have been selected for supplementary teaching (refer to Learning-Support Guidelines pp. 68 – 72).
  - IEPs for pupils who require an individual education plan (refer to Guidelines on the Individual Education Plan Process, NCSE).

- Steps are taken to ensure a collaborative approach between the class teacher and the learning-support/resource teacher through regular meetings after school.
- Resources are available to assist children with special needs e.g. cubes, Dienes blocks, tactile number lines, Numicon etc. This is not an exhaustive list.
- ICT is used to support teaching and learning for children with special needs. This includes software such as Math Workshop, Volcanic Panic and 100 Maths Interactives. Ipad games are also used by the teachers.

Children with exceptional ability

- The following strategies are used by the school/class to provide challenges for children of exceptional ability:
    - Teachers provide a differentiated programme.
    - Children can be facilitated to work on independent research projects.
    - ICT can be used to support their work e.g. Excel.
    - The children can be facilitated to work with older/other pupils.
- The school consults with organisations such as An Óige Thréitheach, Centre for Talented Youth if required

5. Equality of participation and access

- Equal opportunities are given to boys and girls to participate in discussions, use of manipulatives and presentations in mathematics.
- All children have access to services, facilities, or amenities in the school environment.
- Provision may be required for the following:
    - Children experiencing any form of disadvantage – extra support in mathematics, appropriate to their ability.
    - Children with disabilities – extra support in mathematics, appropriate to their ability.
    - Families with literacy problems – simplified language on any maths related writing, oral explanations.
    - Families for whom English is not the first language – simplified language on any maths related writing, oral explanations.

Organisational Planning

6. Timetable

- As set out by the NCCA and Departmental Circulars we allocate 3 hours 25 mins developing numeracy skills at infant level and 4 hours 10 mins from 1st-6th. Class teachers' time-tables must record this time allocation for Mathematics.
- The process of mathematical learning is also developed through integrated activities or thematic/cross curricular approach.
- When drafting timetables for withdrawal of pupils for supplementary teaching, teachers are including these pupils for as much of the mainstream mathematics programme as possible.

7. Homework

- Homework compliments and reinforces work done in school and gives parents an opportunity to be involved in their child's math education.
- All efforts should be made to ensure that mathematics homework reflects the active learning approach as described in the curriculum.
- We discuss and agree on what types of homework are assigned both informally and formally, at staff meetings. Teachers make recommendations and provide guidance on hands on maths in the home environment e.g. matching socks, sorting cutlery, plans on calendar. From 1st class small manageable amounts of maths homework is given once a week. Oral tables are given to learn at home from 2nd class.
- Homework may be differentiated taking into account the range of abilities within the class.
- We ensure that children attending resource/learning-support are not going home with two sets of mathematics homework.

8. Resources and ICT

Equipment, textbooks, supplementary materials

- We acknowledge the importance of concrete materials in the development of mathematical concepts for children in all classes. Maths equipment is available for each class level.
- Mathematics resources/materials:
    - Are stored centrally in store room, though some essential pieces remain in the classrooms for day-to-day use.
    - There is an inventory of resources.

- Textbooks are used at all class levels. There is continuity from class to class. Supplementary text books are available in each classroom.
- All resources are also available for use by the learning-support/resource teacher.
- Ready Set Go Math manuals, manipulatives and sets of laminated game sheets are available to Junior & Senior Infants teachers .
- Numicon resources and manuals are available to all teachers.
- Mata sa Rang Resources -Teaching Number in the Classroom with 4-8 year olds (Mata sa Rang)
- Every Friday Maths time is spent playing Maths games or problem solving in groups. Every Monday children are given no written homework but are assigned family maths homework e.g. board game/chess/draughts/cards.

ICT – Maths Week online

(*See Teacher Guidelines: Mathematics pp. 60-61, Information and Communications Technology (ICT) in the Primary School Curriculum: Guidelines for Teachers)*

- We enable school personnel to research new software. They have opportunities at the staff meetings to arrange for demonstrations, to try out material and to assess whether or not it should be purchased.
- The staff shares opportunities for enhancing pupil learning in mathematics through using the Internet informally and at staff meetings. A list of useful websites is available for teachers in the staff room to view and add to.
- There a code of practice to ensure safe Internet usage (*refer to Acceptable Usage Policy*.) Teachers are recommended to familiarise themselves with material on websites prior to use by the children.

9. Individual teacher's planning and reporting

- The whole school plan and the curriculum documents for mathematics indicate the overall standard expected in each class and provide information and guidance to individual teachers for their long and short-term planning. Planning documents are checked regularly by the Principal.
- The Cúntas Míosúil serves in reviewing and developing the whole school plan/individual teacher preparation for following years. These are stored by the Principal in a folder in the office. Teachers may access the previous year's cúntaisí to guide with future planning.

10. Staff Development

- Teachers are encouraged to attend courses. Notifications from the Teachers' Centre are placed on the staff room notice boards. The teachers are very committed and have attended training in Numicon and Mata sa Rang. The BOM is very supportive of staff development and has assisted towards the cost of training.

- Opportunities are provided at staff meetings and school planning days to facilitate sharing any information relating to maths research, books, resources, websites, associations and courses.

- Opportunities for co-teaching will be identified. This will change from term-to-term depending on the needs of the class. It is managed by the SEN Team, in conjunction with the class teachers and principal.

11. Parental involvement

- The staff welcomes parental involvement in the school and in their child's education. An information meeting is held by the class teacher for all parents at the start of the school year.

- Individual parent/teacher meetings are held annually in February. Teachers and parents are afforded this chance to discuss each individual child's progress in Maths and other areas, 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 are asked to take part in a fun maths activity for homework once a week. Parents are further encouraged to expose their children to everyday maths experiences, such as cooking and shopping.

    - Supporting mathematics at home – refer to http://www.ncca.ie/en/Curriculum_and_Assessment/Parents/Primary/Tip_Sheets_for_Parents/Tipsheet_for_parents_-_numeracy.pdf

    - Early mathematical activities - sorting, classifying etc: An induction meeting is held for Junior Infant parents in September.

    - Methodology for subtraction, particularly at 2nd class: An induction meeting is held for parents in September. A handout is sent home based on information for parents on the NCCA website http://www.ncca.ie/en/Curriculum_and_Assessment/Parents/Primary/Tip_Sheets_for_Parents/Tipsheet_for_parents_subtraction_with_renaming.pdf
      Parents are also referred to a multimedia presentation on this website http://emea67395290.emea.acrobat.com/subtraction/

- Methodology for division, particularly at 4th class: An induction meeting is held for parents in September. A handout is sent home based on information for parents on the NCCA website http://www.ncca.ie/en/Curriculum_and_Assessment/Parents/Primary/Tip_Sheets_for_Parents/Tipsheet_division_as_sharing.pdf

- The role of calculators from 4th to 6th classes: Calculators are used in classroom to facilitate children who are experiencing difficulty.

- Learning number facts at all levels – tables.

- The methods used in number formation at infant level. Handouts are to be given by the infant teachers each year.

- The expectations in relation to layout and presentation of work: Handouts are to be given by a teacher based on *Appendix 3.*

- Our problem-solving strategies: Handout to be given by a teacher (*see Appendix 4*)

- How parents support the teaching and learning of mathematics in our school, e.g. implement the practices set out in the handouts, attend class information meetings, play maths games etc.

12. Community links

- The school recognises that members of the community could make a particular contribution to the mathematics programme e.g. engineers, accountants, bankers etc. They are welcomed into the class to provide assistance.

- Agencies/organisations that could be of assistance to the mathematics programme e.g. shops credit unions and banks – money, bakery/butchers – weight, train/bus stations/stops – timetables, money.

Success Criteria

The criteria that will indicate success are as follows:

- **How do we know that the plan has been implemented?**

  - Teachers' preparation based on this plan.

  - Procedures outlined in this plan consistently followed.

- **How do we know that the plan has achieved its aims? What are the indicators?**
    - Feedback from teachers/parents/pupils/community.
    - Inspectors' suggestions/report.
- **How has the plan enhanced pupil learning?**
    - Has the child been enabled to develop the skills and concepts set out in the curriculum through frequent and meaningful experiences of the curricular content?

Implementation

(a) Roles and Responsibilities

The plan will be supported, developed and implemented by all staff members. The plan will be monitored and evaluated by the teaching staff regularly.

(b) Timeframe

The plan should be implemented fully by September 2017.

Review

It will be necessary to review this plan on a regular basis to ensure optimum implementation of the Maths curriculum in the school. The plan will also develop as the school grows over the coming years.

(a) Roles and Responsibilities

Those involved in the review include**:**

- Teachers
- Pupils
- Parents
- BOM
- DES

(b) Timeframe

The plan is to be reviewed during the school year 2020/2021.

Ratification and communication

The proposed policy will be communicated to members of the Board of Management prior to the meeting of the BOM in December 2017. Assuming it is ratified; parents will be made aware in the next newsletter that the plan is available for viewing on our school website.

Appendix 1 Maths language across the Strands

Junior Infants	**Senior Infants**
Long/short, longer/shorter More than/less than/ same as First/last Over, under, up, down, on, beside, in Shape Square, circle, triangle, rectangle Roll/ do not roll Fit/ do not fit Round/not round, thick, thin Long/short, tall/short, wide/narrow, longer, shorter, wider than Heavy/light, heavier/ lighter, balance, weigh	As Junior Infants plus: Ordinal number – first, second, third, last Above, below, near, far, right, left Cube, cuboid, sphere, cylinder Edge, corner, face, straight, curved, round, flat, side, corner As long as/as wide as/longest/shortest Yesterday/today/tomorrow/seasons/soon/not yet/birthday Cost, price, cheap/expensive, change, too much/too little Cost, price, cheap/expensive, change, too much/too little Pictogram sets
First Class	**Second Class**

As Senior Infants plus:	As First class plus:
Between, underneath, on top of,	Quarter
around, through, left, right	Cone, oval
Square, rectangle, triangle, circle,	Metre, centimetre
semicircle	Euro Area
Half	Digital clock/time
Cube, cuboid, cylinder, sphere	Block graph
Length, width, height, measure, nearly	Corners
a metre, a bit more than/a bit less than	Symmetry
a metre	
Heavy, heavier, heaviest, light, lighter, lightest, balance	
Pour, fill, full, empty, holds more, less or the same amount as	
Reading day, date and month using calendar	
Hour, half hour	
Metre, litre, kilogram	

Third Class	**Fourth Class**
As Second class plus: Regular/irregular shapes Sphere, triangular sphere, prism, pyramid Sides, angles, parallel and non-parallel lines Tessellate Nets Symmetry Vertical, horizontal and parallel lines Clockwise/anti-clockwise Gramme, kilogram Possible, impossible, might, certain, not sure	As Third class plus: Equilateral, isosceles, scalene triangle, parallelogram, rhombus, pentagon, octagon Diagonal Oblique, perpendicular lines Acute, obtuse and right angles Perimeter Hundredths Chance, likely, unlikely, never, definitely Bar line graph Scale
Fifth Class	**Sixth Class**
As Fourth class plus: Thousandths Prime and composite numbers Square and rectangular numbers Factors, multiples Positive and negative numbers Equations Quadrilaterals Diameter, radius, chord, circumference, arc, sector, tangent Tetrahedron Vertices Reflex angle, degrees Millimetre	As Fifth class plus: Square roots Quotients Octahedron Scale Ares/hectares Trend graph

Appendix 4 Problem solving

1st-2nd class **RUDE**

Use the RUDE rule when working out a word problem

Read

Underline

Draw

Evaluate (i.e. work out)

5th 6th class **BOMDAS**

Use the BOMDAS rule when working out a number problem

Brackets

Of

Multiply

Divide

Add

Subtract