**Mathematics Policy Galbally National School**

**Mathematics**

**Aims:**

We endorse the aims of the Primary School Curriculum for Mathematics which are:

* To develop a positive attitude towards Mathematics and an appreciation of both its practical and aesthetics 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 proficiency in fundamental mathematical skills and in recalling basic number facts.
* To enable the child to acquire an understanding of mathematical concepts and processes to his/her appropriate level of development and ability.

**1. Strands and Strand Units**

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

|  |  |
| --- | --- |
| **STRANDS** | **STRAND UNITS** |
| Early Mathematical Activities (Infants) | Classifying, Matching, Comparing Ordering |
| Number | Counting, Comparing and Ordering, Analysis of Number (introduced in Infants )Numeration, Place Value, Operations: Addition, Subtraction, Fractions (introduced in 1st 2nd)Multiplication, Division, Decimals (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. Resources**

We acknowledge the importance of concrete materials in the development of mathematical concepts for children in all classes. Each class has access to Maths equipment suitable for that class level. The class teacher is responsible for checking these resources at the end of the year. A list of items that have to be repaired/replaced or additional items needed should be sent to Mrs. Byrnes.

* An inventory of all Maths equipment in the store is available from Mrs. Byrnes.
* All Maths equipment bought with school funds remains the property of the school
* Teachers may borrow equipment from the store but must make sure that it is returned promptly

**Resources are stored in a central area accessible to all teachers**

***Textbooks*** are in line with the content objectives for each class level. Textbooks reinforce the concept taught and give adequate practice in each activity.

* Teachers should not use the text chosen for the next class-level in the same scheme as this may lead to difficulties in terms of continuity and progression in the following year
* Where a teacher deems it necessary supplementary materials will be designed/supplied

**Jun. Sen. Infants:**Busy at Maths
**1st class:**          New Wave Mental Maths & Busy at Maths

**2nd Class:** Mathemagic 2 & New Wave Mental Maths
**3rd Class:** Mathemagic 3 & New Wave Mental Maths

**4th Class:** Mathemagic 4 & New Wave Mental Maths

**5th Class:** Busy at Maths, New Wave Mental Maths & Brainteasers

**6th Class:** Busy at Maths & Brainteasers

**3. Approaches and Methodologies**

The following approaches and methodologies are used throughout the year:

* **The use of Manipulatives:**Children will have access to and use a broad range of mathematical equipment during lessons. (see attached list of resources)
* **Talk and Discussion:** Talk and discussion is seen as an integral part of the learning process and opportunities should be provided during the Maths class for children to discuss problems with the teacher, other individual children and in groups.
* **Active Learning/ Guided Discovery:** As part of the Maths programme for each class 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.
* **Collaborative and Co-operative Learning**

Collaborative and co-operative learning in junior – 6th classes is promoted using the following strategies:

* Encouraging the children to listen
* Encouraging the children to take turns
* Seeing that others opinions are important
* Children working in pairs and groups while playing mathematical games.

Teachers use a variety of organisational styles to encourage co-operative and collaborative learning: pair work, group work and whole class work.

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

**Number:**
The following number limits for each class will be adhered to:

|  |  |
| --- | --- |
| **Class** | **Numerals** |
| Junior Infants | 0 – 5 |
| Senior Infants | 6 – 10 |
| 1st Class | to 99 |
| 2nd class | to 199 |
| 3rd class | to 999 |
| 4th class | to 9999 |

**Data:**
Children are encouraged to collect real data i.e. infant classes collect personal information and represent it on a pictogram for example; older children create and interpret bar charts and pie charts. Children are made aware of the importance of entering relevant data and asking clear question to extract the required information from the data.

**Language – Concepts/ Skills**
Each Class Teacher has a copy of the school’s Maths Language Plan

**Maths Language used in the School**

Outlined below is a common approach to symbols names and numerical operations. The children are made aware of other language used in association with symbols as they progress from class to class.

**Junior Infants**

Symbols are not introduced until Senior Infants

+ use the word **and**

= use the word **make**

2+3=5 2 and 3 makes 5

**Senior Infants**

Introduction of Signs + and =

**Addition**

+ use the word **and** or **plus**

= use the word **make** or **is the same as** or **equals**

2+5= 7 2 and 5 make 7, 2 and 5 is the same as 7, 2 plus 5 equals 7

**Subtraction**

Solve simple oral and pictorial problems 0-10

7 birds 2 fly away. **Cross out** the 2.

**First Class**

7 and 2

7 add on 2

9 is **more than** 2 by \_\_\_\_

What is 2 more than 7?

**Addition of tens and units without renaming:**

 25

 + 13 **5 and 3 is 8, 2 and 1 is 3**

 38

**Addition of tens and units with renaming:**

 2 8

+ 1**1** 4 8 and 4 is 12, rename the 12 into 1 ten and 2 units. Put down the 2 and bring over

 4 2 (carry) the 1. 2 and 1 is 3 and 1 is 4.

**Subtraction**

7 **take away** 2 equals 5

7 **minus** 2 equals 5

7 **subtract** 2 equals 5

2 **less than** 7 is 5

**Subtraction without renaming:**

 2 9 9 take away 8 is 1

- 1 8 2 take away 1 is 1

 1 1

**Second Class**

Addition as per 1st class.

Find **the sum of** 7 and 2 .

The **total of** 7 and 2 is 9.

**Subtraction with renaming:**

 4 4 Start at the top

- 1 6 Say : 4 take 6 I cannot do. Rename 4 tens to tens and 10 units,

 therefore the units become 14.

 Read from the top Say: 14 take 6 is 8. 3 take 1 is 2.

 Answer is 28.

Please do not say ‘**from**’ i.e. 6 from 4.

**3rd Class**

**Addition and Subtraction** : Revise and consolidate

**Subtracting three digit numbers with renaming:**

 **5 1 4 \* Always start at top of sum**

**- 2 1 6** 4 take 6 I cannot do ,rename a ten,

 **2 9 8** 14 take 6 is 8. 0 take 1 I cannot do

 So I rename the hundreds, 10 take 1

 is 9 , 4 take 2 is 2

**Multiplication:**

2 **multiply by** 3 equals 6

2x3= 6

2 **groups of** 3 =6

2 **times** 3 is 6

The **product of** 2 and 3 is 6

2 multiplied by 3 is 6

2 3’s are

**Division:**

6 ÷2 =3

6 sweets **shared among** 2 pupils equally. Each gets 3 sweets.

6 **divided by** 2 is 3, **How many 2’s** in 6, **2 into 6** goes 3

**Factors of** 6 are 2 and 3

6 ÷ 3 = six divided by 3 is 2 or 6 divided by 3 equals 2 or three into 6 goes 2 times.

3 │ 7 **7 ÷ 3 three into 7 goes twice remainder 1**

 2 R 1

**4th Class**

Share 48 between 2

2 | 4 8 1) 4 divided by 2 equals 2, 8 divided by 2 equals 4 **or**

 2 4 2) 2 into 4 goes twice, 2 into 8 goes 4 times

3 |7 5 7 divided by 3 equals 2 remainder 1, 15 divided by

 2 5 3 equals 5 **or** 3 into 7 goes 2 times remainder 1,

 3 into 15 goes 5 times.

**5th Class**

**Addition**: **increase** 200 by 20%

A **positive** number on the number line.

**Subtraction**: decrease

 **Multiplication**: multiples

**Of means multiply**

5 = 5 **by** 5 or 5 **to the power of** 2.

**Division:**

**Numerator, Denominator**, Divisor (Factor) and equivalent fractions

**6th Class**

**Addition:** V.A.T. increase by 21%

Simple Interest, Profit– Increase, Sale Price

**Subtraction:** Use decrease –**discount, loss,**

**reduction, negative numbers.**

**Multiplication:** 5 to the power of 2, L.C.M.

**Division:** H.C.F. Ratio 2:1 = 4:2

Two is to one represents the same ratio as 4 is to 2.

**Tables First and Second Class**

Tables are recited as follows:

**Adding : Say**

0 and 2 is 2

1 and 2 is 3

2 and 2 is 4

3 and 2 is 5

Addition facts up to 10 will be memorised by the end of Second Class .

**Subtraction**

Subtraction will be taught as the inverse of addition.

**(Take Away) Tables : Say**

2 take 2 is 0

3 take 2 is 1

4 take 2 is 2

5 take 2 is 3

Children from 2nd Class recite their tables regularly and tables are reinforced every day. Children are encouraged to memorise tables and they are given for homework

**Practicing Number Facts:**

|  |
| --- |
| **7** |
| **4** | **3** |

 **7 - 3 = 4 4 + 3 = 7**

 **7 - 4 = 3 3 + 4 = 7**

Children are taught the relationship with addition.

Knowing addition tables means you know subtraction tables.

**Tables 3rd—6th Classes**

**Multiplication**

X and ÷ are introduced in 3rd Class

1X 2 =2 **Say**: 1 multiplied by 2 is 2

2X2=4 **Say:** 2 multiplied by 2 is 4

3X2=6 **Say**: 3 multiplied by 2 is 6

Multiplication facts up to 12 will be memorised by the end of 4th Class and will be revised up to the end of 6th Class.

Multiplication is a natural progression from extended addition e.g. 3 groups of 3, 4 groups of 3, 5 groups of 3 etc..

Therefore to ensure consistency and avoid confusion it is important that tables are recited as stated above.

**Division**

**Division** will be taught as the inverse of multiplication.

**Say:** 2÷ 2 =1 2 divided by 2 is 1

 4÷ 2 =2 4 divided by 2 is 2

 6÷ 2 =3 6 divided by 2 is 3

|  |
| --- |
| **36** |
| **4** | **9** |

 **4x 9= 36 36÷ 9=4**

 **9 x 4=36 36÷ 4=9**

Children are taught the relationship with multiplication.

Knowing multiplication tables means you know division tables.

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

* Applying and Problem Solving
* Communicating and Expressing
* Integrating and Connecting
* Reasoning
* Implementing
* Understanding and Recalling
* Estimation

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

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

* Read the question and underline the key words
* If the numbers are large, use smaller numbers to help you see what has to be done
* Look for a pattern
* Decide whether you need to +, -, x or /
* Make a drawing or a model to help you to see the problem
* Think logically – use estimation and common sense to help you.

*Answering the problem*

* Use all the important information
* Check your work
* Decide if the answer makes sense
* Write the answer in a complete sentence

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

Resources used for problem solving with 5th/6th classes include the following:

Teacher designed booklets, Prim-Ed books in staff room, internet and Maths *s*cheme.

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

* Front end
* Clustering
* Rounding
* Special numbers

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

**Presentation of work**
There is an agreed approach to numeral formation in the junior classes. The rhymes or stories may vary but the formation is as follows:

* 1 – Stand up tall
* 2 – Rub the swan’s head around it’s long neck and back along it’s feathers
* 3 – Bounce the ball off the wall
* 4 – One car drives down and around the corner and the other drives straight through
* 5 – Rub down his long back, around his big belly and pull off his hat.
* 6 – Feed the elephant and watch him roll his trunk
* 7 – Walk along the tightrope and back down the slide
* 8 – Rub the snake and wipe your hand!
* 9 – Right around the hula hoop and hold it for the lion
* 10 – Stand up tall. There’s nothing left to do.

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

* Oral Presentation
	+ Teacher designed work sheets based on strand unit being taught.
	+ Work in class Maths Book which is an activity book
	+ Recording work.
	+ Using concrete materials to draw a picture, pictogram
	+ Number stories, Number rhymes (Junior classes)
	+ Birthday chart/ graph of favourite fruit/ colour etc.

**A pencil only is used for writing numbers, and problems in Maths right up until the end of 6th class. Children are allowed to use erasers. A red biro is introduced in 3rd class for correction purposes only.**

**4. Assessment and Record Keeping:**

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 in our school. Teachers use a number of tools for assessing pupils’ work including self-assessment, questioning, teacher observation, teacher designed tasks and tests, pupil profile, and standardised testing.

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
* 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 during May from 1st - 6th classes 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. ***The full booklet is kept for one year after the test is administered. After this year, the front cover of the test with test scores is kept on file for ten years and the rest of the booklet is binned.***

Following assessment teachers may do the following:

* Give extra help to individuals who need it
* Decide to increase time spent using concrete materials
* Discuss the situation with forwarding teacher at the end of the school year and beginning of new school year
* Discuss concerns with parents and encourage parents to help children informally e.g. Give me 3 spoons, Help me set the table, How many doors etc.
* Consult with the Special Needs team who will provide support when needed using available resources within the school.

**5. Children with Different Needs**

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

Those children who receive scores at or below the 10th percentile on the standardised tests will have priority in attending 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.

Class teachers of *New Irish*children and children from the travelling community will ensure appropriate Maths language is covered in class. Resource teachers will provide extra support for travellers falling behind, due to poor attendance.

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

**6. Time-table**

Two hours and 15 minutes for Mathematics is allocated for Infant classes. Class teachers’ time-tables must record this time allocation form Mathematics. There is discretionary time allocated for all classes each week and this can occasionally be used for Maths

**7. Homework**

See the school Homework Policy.

**8. ICT**

**Calculators**
From fourth class upwards children are permitted to use calculators in specific strands and strand units 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. It is intended that each child would have the use of a calculator at some stage during the school year.

* Keys are of a reasonable size and have a positive click action
* They have a display of at least 8 digits and be large enough for two or three children to see
* They have a memory function

**Maths Software available in school**

* Robo Logic
* Puzzle School
* Match it up 1, 2 and 3
* Count and Match 1 and 2
* Maths in Action
* Maths Work out
* Sort it out 1, 2
* Constructor
* Show Me
* Pizza Fractions 1 and 2

Software is updated regularly

**9. Individual Teachers’ Planning**

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

**10. Staff Development**

Teachers are made aware of any opportunities for further professional development through participation in courses available in Education Centres or other venues. Skills and expertise within the school are shared and developed through inputs at staff meetings.

**11. Parental Involvement**

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

* The importance of trial and error, estimation, the use of concrete materials and the role of calculators
* The school’s approach to e.g. subtraction, division, calculations using fractions..
* The fact that Maths homework may be 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 or other issues.

Individual parent/teacher meetings are held annually in November. 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.

**12. 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

**13. Implementation, Review and Ratification**

Class teachers are responsible for the implementation of the Maths programme for their own classes.

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

This updated policy was ratified by the Bord of Management.

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CHAIRPERSON DATE