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## Whole School Policy for Maths

## Introductory Statement

This mathematics policy was drawn up in collaboration with staff members during the 2022 - 2023 academic year.

## 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.


## 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. The curriculum comprises five strands, which should be seen and taught as interrelated units in which understanding in one area is dependent on and supportive of ideas and concepts in other strands. Linkage within the subject is essential and while number is essential as the medium for maths calculations, all other areas should receive a corresponding degree of emphasis.

The number strand begins with a section called Early Mathematical Activities which is distinct to the infant syllabus and is listed hereunder as if it is a separate strand.

| Strands | Infants | $1^{\text {st }}$ and $2^{\text {nd }}$ class | $3^{\text {rd }}$ and $4^{\text {th }}$ class | $5^{\text {th }}$ and $6^{\text {th }}$ class |
| :---: | :---: | :---: | :---: | :---: |
| Early Mathematical Activities | Classifying <br> Matching <br> Comparing <br> Ordering |  |  |  |
| Number | Counting <br> Comparing and Ordering Analysis of Number | Counting and <br> Numeration <br> Comparing and <br> Ordering <br> Place Value <br> Operations <br> Addition <br> Subtraction <br> Fractions | Place Value <br> Operations Addition <br> Subtraction <br> Multiplication <br> Division <br> Fractions <br> Decimals | Place Value <br> Operations Addition <br> Subtraction <br> Multiplication <br> Division <br> Fractions <br> Decimals <br> Percentages <br> Number Theory |
| Algebra | Extending Patterns | Exploring and Using Patterns | Number Patterns and Sequences Number Sentences | Directed Numbers <br> Rules and <br> Properties <br> Variables <br> Equations |
| Shape and Space | Spatial Awareness <br> 2D Shapes <br> 3D Shapes | Spatial Awareness <br> 2D Shapes <br> 3D Shapes <br> Symmetry <br> Angles | 2D Shapes <br> 3D Shapes <br> Symmetry <br> Lines and Angles | 2D Shapes <br> 3D Shapes <br> Symmetry <br> Lines and Angles |
| Measure | Length <br> Weight <br> Capacity <br> Time <br> Money | Length <br> Area <br> Weight <br> Capacity <br> Time <br> Money | Length <br> Area <br> Weight <br> Capacity <br> Time <br> Money | Length <br> Area <br> Weight <br> Capacity <br> Time <br> Money |
| Data | Recognising and Interpreting Data | Representing and Interpreting Data | Representing and Interpreting Data Chance | Representing and Interpreting Data Chance |

## Maths Skills

Spanning the content are the skills that the child should develop while engaging with the maths curriculum.
These skills are:

- Applying and problem-solving
- Communicating and expressing
- Integrating and connecting
- Reasoning
- Implementing
- Understanding and recalling


## Approaches and Methodologies

The approaches and methodologies that teachers will use in their delivery of the maths curriculum will include:

- The use of manipulatives - Where practical and possible, children should have access to and use a broad range of mathematical equipment during lessons.
- Talk and Discussion as an integral part of the learning process. Opportunities should be provided during maths class for children to discuss problems with the teacher, in pairs, in groups.
- Active Learning and 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 Cooperative Learning: Collaborative and co-operative learning is promoted using the following strategies:
- Encouraging children to listen
- Encouraging children to take turns
- Seeing that others' opinions are important
- Children working in pairs/small groups while playing mathematical games.

ICT is very important in the teaching of maths with opportunities for the pupils to engage in interactive activities, programmes and games developing understanding of mathematical concepts, problem solving skills and self-motivation in mathematical activities. The Cracking Maths programme has interactives to use with each class level.

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 garden, 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.

Problem solving: Children are encouraged to use their own ideas as a context for problem solving. Problem solving is taught as a stand alone lesson each Friday in every class. Pupils from $1^{\text {st }}-6^{\text {th }}$ also complete two/three problems in the Master Your Maths programme each night for homework.

Language - Concepts/ Skills: There is a strong link between language and concept acquisition. We feel it is important to have a common approach to the terms used and the correct use of symbol names. This language has been agreed at whole school level in order to ensure consistency from one class to the next and to help avoid confusion for children having difficulties with maths. The language contained in the Cracking Maths teachers' manuals will be used throughout the school.

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

## Resources

We acknowledge the importance of concrete materials in the development of mathematical concepts for children in all classes.

- The infant classroom is assigned their own set of maths equipment stored in boxes in their classrooms. This equipment is assigned to that level and stays with that class level.
- All maths resources are stored in a central area in a specifically assigned are in the STREAM Room.
- As courtesy towards others, teachers are asked to ensure that property is promptly returned when finished with and left back in the correct box/place.
- A list of items that must be repaired/replaced or additional items needed should be sent to the principal/deputy principal.
- All maths equipment/books bought with school funds remain the property of the school.

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.
- The textbooks/resources used in each class are:
$>$ Junior Infants - $6^{\text {th }}$ classes: Cracking Maths Scheme.
$>1^{\text {st }}$ class $-6^{\text {th }}$ classes: Master Your Maths mental math and problem-solving workbooks (CJ Fallon)
$>1{ }^{\text {st }}-6^{\text {th }}$ classes: Prim-Ed: The Maths Box activity cards with self-correcting answer cards.

ICT/Interactive whiteboard is a very valuable resource in teaching of maths. Teacher recommended websites are included in Appendix 3.
iPads are available to all classes and have a number of mathematical apps stored on them.

## 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 several tools for assessing pupils' work including self-assessment, conferencing, portfolio, concept-mapping, questioning, teacher observation, teacher designed tasks and tests, pupil profile and standardised testing.
- Class teachers input the scores of standardised tests results into Aladdin where a class graph is generated to identify class averages in all strands and strand units, and specific areas of the maths curriculum requiring attention.

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 seenin the Teacher's Manual.
- Ongoing teacher-designed tests. When felt appropriate by class teacher the children will bring the tests and the results of such tests homefor signing. Test results are kept by the class teacher and can be passed on to the next teacher if requested.
- 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 - 6thclasses while teacher designed tests are used throughout the year. Each child's score is entered on Aladdin. Class lists are printed and analysed by class teacher/principal/ S.E.N. team. Results of the standardised test are communicated to parents through the end of year reports.
- Self-assessment

Following assessment, teachers may do the following:

- Give extra help to individuals who needs it
- Decide to increase time spent using concrete materials
- Discuss the situation with forwarding teacher at the end of the school year and beginning ofnew school year
- Discuss concerns with parents and encourage parents to help children informally. (See section12: Parental Involvement)
- Consult with the S.E.T team who will provide support when possible using available resources within the school.


## 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. The introduction and development of each topic will be structured in a graded, sequential way to allow the individual child to develop and participate at his/her own level andpace.
- When a child demonstrates a particular difficulty, either with a topic, strand or overall, theclass teacher will provide extra support and assistance to the child.
- Those children who receive scores at or below the 12 th percentile on the standardised testswill have priority in attending the S.E.T team for supplementary teaching formaths. The availability of supplementary teaching for Maths, however, depends on the case load of the S.E.T team. Arrangement will be in accordance with the recommended selection criteria as determined by the DES and laid out in the school's SEN policy. Support will include various models depending on needs of child/class. Should it be decided that withdrawal is required, parents will be notified and permission will be sought.
- Children with exceptional ability in maths will be given extra work based on the concept being taught in class to enable them to reach their full potential. 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. Teachers should keep a record of the differentiated approach adopted for these children.


## Time-table

In line with the requirements as set out by Circular (0056/2011), the time spent on mathematics shall be 3hours and 25 minutes per week for Infants and 4 hours and 10 minutes per week for students with a full day. Where possible the S.E.T team and principal will facilitate team-teaching, giving priority to splitlevel classes.

## Homework

See the school Homework Policy. Teachers are mindful of the different levels of ability when setting homework assignments. Parents are encouraged to liaise with teachers and advise of difficulties with homework assignments so that the quantity of work can be amended if deemed necessary.

## ICT

ICT is very important in the teaching of maths with opportunities for the pupils to engage in interactive activities and games developing understanding of mathematical concepts, problem solving skills and selfmotivation in mathematical activities. The Cracking Maths programme has comprehensive ICT interactive exercises for all concepts at each level.

The interactive white board is a very valuable resource in teaching of maths, with opportunities for the pupils to engage in interactive activities and games developing understanding of mathematical concepts and problem-solving skills. For this review, teachers compiled a list of recommended, frequently used websites. These are included in Appendix 3.

## Individual Teachers' Planning

Teachers should base their yearly and short-term plans on the approaches set out in this whole school plan for maths and curriculum documents. Each class teacher will familiarise themselves with the objectives for their own class level. Each teacher will bear in mind that in planning, a balance between the strands should be kept throughout the year. Work covered will be outlined in the Cuntas Míosúil which will be uploaded onto the school's shared Google Drive.

## Staff Development

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

## Maths Week:

## Parental Involvement

Parents are encouraged to support the school's programme for maths. As parents are the primary educators, their involvement is considered an important aspect of successful implementation of the maths curriculum. Through exposure to common math concepts in the home and local environment, children can be equipped with necessary mathematical skills.

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. Parents will be informed if a child is following a differentiated maths programme in the classroom/for homework.

## 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 theirage and ability.
- Implementation of the school plan will be evident in teachers' preparation and monthly plans.


## Implementation and Review

Class teachers are responsible for the implementation of the maths curriculum for their own classes. The ISM team supports the implementation of the maths curriculum and is responsible for the distribution and monitoring of resources.

Progress made during the school year will be reviewed in August/September of each year and will be based on results ofassessments across all classes and on teachers' views as to the effectiveness of the plan.

Results from the standardised maths tests (Sigma T) will be analysed every year and areas of concern/weakness will be highlighted and discussed.

## Ratification of policy

This policy was adopted by the Board of Management on $\qquad$ . This policy will be reviewed and updated as necessary in line with the Department of Education guidelines.

Signed: $\qquad$
Chairperson of BoM

Date: $\qquad$

Signed: $\qquad$ Principal

Date: $\qquad$

## Appendix 1: Agreed Procedures/Language

Please refer to section above to see strands and strand units for each class level.

## 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 |

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

## 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: Straight down from the star
- 2: Around from the star, then down, then straight
- 3: Start at the star, then round and round
- 4: Straight down from the star it goes, then across and put on its nose
- 5: Go down from the star, around and put its hat on
- 6: Start at the star then down we go, then all around halfway or so
- 7: The star's on his nose, go across, then straight down to his toe
- 8: Around and around and up it goes until his tail can touch his nose
- 9: Start at the star and around I go, then down a stick handle down below

In all classes maths work is presented using a variety of formats namely:

- Oral presentation
- Teacher designed work sheets based on strand unit being taught
- Work in textbook which is filled in as an activity book up to 3rd class
- Recording work in copies, particularly in senior classes.
- Using concrete materials to draw a picture, pictogram
- Number stories, Number rhymes (Junior classes)
- Birthday chart/ graph of favourite fruit/ colour etc.


## 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.

## Problem Solving

Children are encouraged to use their own ideas as a context for problem solving.

THE RUDE WAY OF SOLVING A MATHS PROBLEM: Children from $1^{\text {st }}-6^{\text {th }}$ classes, throughout the school are encouraged to use the following abbreviated model for solving a maths problem -

- Read,
- Underline the key words,
- Draw a diagram of the problem,
- Estimate 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. This model is displayed in all classrooms for pupils to see and use on a daily basis.

Resources used for problem solving with classes include the following:

Prim-Ed: Maths Boxes; Brain Snack (R.I.C. Publications: problem-solving cards for age 8+), Teacher designed booklets, Interactive Whiteboard, Cracking Maths, Master Your Maths, Maths Sleuth.

## Language/Resources

## Language - Concepts/ Skills

There is a strong link between language and concept acquisition. We feel it is important to have a common approach to the terms used and the correct use of symbol names. This language has been agreed at whole school level in order to ensure consistency from one class to the next and also to help avoid confusion for children having difficulties with Mathematics. Our agreed strategies/language are:

Language recommended in the Cracking Maths Teachers' Manuals is used throughout the school.

## JUNIOR INFANTS:

No signs used

| Addition: | Language: and, makes, add, is the same as, altogether makes |
| :--- | :--- |
| More, less |  |

## SENIOR INFANTS:

Introduction of signs: +, =
Vocabulary to match this: plus, equals (and, makes initially used as in junior infants)

| 2 <br> +1 | Top down: <br> 2 plus 1 equals 3 <br> $2+1$ equals 3 |
| :--- | :--- |
| 3 |  |
| $2+1=3$ | reads 2 plus 1 equals 3 or 2 and 1 makes 3 |

## FIRST CLASS

| Addition | Language: Add, count on, more than, total |
| :--- | :--- |
| Subtraction | - is introduced as a symbol in first class <br> Language: minus, take away, less than, left |
| 16 <br> -4 | Vertical: start from the top using the words 'take away'16 take <br> away four equals |
| $5-1=$ | Horizontal: Read from left to right using the words 'take away'5 take away <br> 1 equals |
| Comparing and <br> Ordering | More than, less than, the same as. |
| Language | 100 square; target board; rows; columns. |

PLACE VALUE: THE WORD ‘UNITS’ WILL BE USED RATHER THAN ‘ONES’ RENAMING/GROUPING WILL BE THE METHOD USED THROUGHOUT THE SCHOOL

## SECOND CLASS

All computation bigger than tables should be written vertically rather than horizontally (as in notation board) to aid comprehension of hundreds, tens and units.

$\left.$| Addition | Language: sum of, addition |
| :--- | :--- |
| $7+3+8=18$ | 7 plus 3 plus 8 equals 18 (7plus 3 equals 10 plus 8 equals 18 ) |
| 6 |  |
| 3 |  |
| +6 |  |$\quad$| 6 plus 3 plus 6 |
| :--- |
| encourage $6+6+3$ | \right\rvert\, | Language: subtraction, subtract, take away, from, less than, minus, |
| :--- |
| difference |, | 7 take away 8 I cannot do so I rename a 'ten' to ten units, I now |
| :--- |
| have 1 ten. 7units+10units = 17units. 17 take 8 equals 9.1 ten take away 1 |
| ten leaves 0. |

## THIRD CLASS/ FOURTH CLASS

## Rounding to nearest 10

$1,2,3$ and 4 hey, ho, down we go
$5,6,78$ and 9 hey, ho up we go
Half way there which way we go?
Round me up hey, ho.

## Rounding to nearest 100

If the 10 digit is $1,2,3$ or 4
Leave the 100 as before,
If it's $6,7,8$ or 9
Round up to the next 100 on the number line

| Addition and Subtraction | Language: to increase, what has to be added to?, add more, plus,sum of, total, altogether <br> Subtract, minus, leave, less than, fewer, decrease, what's left,find the difference between. |
| :---: | :---: |
| Multiplication/ Division | $\div$ and $\mathbf{x}$ are introduced as symbols in $3^{\text {rd }}$ class |
| Multiplication $14 \times 7$ | Language: lots of, times, multiply, groups of, product, repeated addition. <br> 14 groups of 7 all addedtogether, 14 groups of 7,14 times 7,14 sevens, 14 by 7 . |
| Short multiplication Long multiplication Multiply by 10 Multiply by 100 : | Multiply top row by single digit in order, starting with units, then tens, then 100's. <br> From bottom, units first. Language as above. Carry box used to distinguish the number carried over to be added, from the number being multiplied. <br> When multiplying by $\mathbf{1 0}$ : Add one zero <br> When multiplying by 100: Add two zeros |
| Division $14 \div 7$ <br> all signs used $\div$, / etc. | Language: Share equally, divided into equal groups of. <br> How many groups of 7 in 14 , how many 7 s in 14 , repeated subtraction(how many times can I take 7 from 14; 14-7-7) 14 divided by 7,14 shared 7 times, 14 split 7 ways. Remainder. |
| Fractions <br> $1 / 4$ of 32 <br> 7/2 | Share 32 among 4 and/or 32 divided by 4 7 divided by 2 <br> $1 / 2$ is equivalent to $2 / 4$ (4th class) <br> $1 / 2$ is the same as $2 / 4$ <br> $1 / 2$ is equal to $2 / 4$ |
| Decimals | $1 / 10$ is equal to $0.11 / 100$ is equal to 0.01 Include zero before decimal point |
| Tessellation | Fit together with no spaces |

Calculators: From fourth class upwards children are permitted to use calculators 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-solvingquestions. It is important that the skill of estimation is developed along with the use of the calculator.

## FIFTH/SIXTH CLASSES

| Number: <br> Multiplication/Div ision | Language: square, prime, composite, rectangular numbers.Finding common multiples by listing numbers <br> Finding common factors by listing factors <br> The words 'product' and 'quotient' are introduced. Problemsinvolving sum, difference, products, quotients, <br> Long division: Does McDonalds Sell Burgers: <br> D-divide; M-multiply; S-subtract; B-Bring down. |
| :---: | :---: |
| Fractions: | All children are taught to MEMORISE TABLE OF EQUIVALENT FRACTIONS, DECIMALS AND PERCENTAGES. <br> Numerator, denominator |
| $1 / 2+1 / 4=$ | $\overline{4}^{+}-\frac{1}{4=4}$ |
| $1 / 2-1 / 4$ | $=4--{ }^{4} 4$ |
| Mixed numbers + and - <br> $31 / 2-13 / 4=$ | Initially the children will be asked to deduce/hypothesise for themselves how to solve the addition and subtraction of mixed numbers. Those experiencing difficulties in this, through guided discovery by the teacher will be exposed to the following methods and from there will deduce the methodthey find logical to their thinking. |



| Multiplication ofdecimals | Multiplying a decimal by a whole number <br> Multiplying a decimal by a decimal <br> Count the numbers behind the decimal points in the question and make sure that there is the same amount of numbers behind the decimal point in the answer. |
| :---: | :---: |
| Division by decimals | Multiply the divisor by 10/100 to change to whole number. If you multiply the divisor by $10 / 100$ you must multiply the dividend by $10 / 100$. |
| Converting afraction to a decimal | You divide the numerator by the denominator (divide the top by the bottom) or if possible you change the number to tenths/ hundredths and then convert to decimal. Look out for $1 / 2,1 / 4,1 / 5,1 / 10,1 / 100$ |
| Percentages |  |
| Converting a fraction to a percentage | You multiply by a 100/1 or if possible you change the fraction to hundredths. |
| Time |  |
| Addition | Add minutes to minutes <br> Hours to hours and simplify (changing minutes to hours) |
| Subtraction | If number of minutes is bigger on the bottom line, convert...Take hour and change to 60 minutes. Add to other minutes and rewrite sum. |
| Co-ordination | Introduce ( $\mathrm{x}, \mathrm{y}$ ) axis: " Y to the Sky" <br> Explain $\mathbf{x}$ comes before $\mathbf{y}$ in the alphabet. This will help themremember which comes first. <br> "Along the corridor (x); Up the Stairs (y)" |
| Area | Rectangle/square <br> Length x width ( $\mathrm{l} \times \mathrm{w}$ ). breadth $=$ width <br> Ares ( 1 Are $=100 \mathrm{~m}$, 1 hectare $=10,000 \mathrm{~m}$ ) Relationship <br> of sq.m to sq.cm. <br> Area of room from scale plan <br> Surface area <br> Find the area of one face. Count the faces and multiply bynumber of faces. <br> Cube and Cuboid |


| Circle | Radius, diameter, circumference, arc, sector, <br> Relate the diameter of a circle to its circumference by measurement. <br> Measure the circumference of a circle using apiece of string. <br> Construct a circle of given radius/diameterExamine area <br> by counting squares. |
| :--- | :--- |
| Length | Irregular Shapes <br> Look for regular shapes. Divide the shape and draw diagrams. Add areas a, b <br> and c. etc. |
| Lines and Angles | Right angle, acute, obtuse, reflex, straight, degrees, protractor, <br> ruler. Draw out angle before measuring if it is in a shape. |
| 2D shapes | Sum of the angles in a triangle $=180$ <br> Sum of the angles in a quadrilateral = 360Sum of angles <br> in a circle $=360$ |
| 3D shapes | Identify regular tetrahedrons, nets, construct |

## Appendix 2:Tables

- Addition/subtraction facts up to 10 will be taught and learned by the end of second class and multiplication/division facts up to 12 by the end of fourth class. Both will be revised up to the end of sixth class.
- Multiplication is a natural progression from extended addition e.g. 3 groups of 3, 4 groups of 3,5 groups of 3 etc. Thus tables are recited throughout the school as follows: $3 \times 3=9$ (three threes are nine), $4 \times 3=12$ (four threes are 12), $5 \times 3=15$ (five threes are fifteen). All teachers are expected to teach tables this way in order to ensure consistency and avoid confusion as children move from one class to the next.
- A variety of methods will be used including counting $2 \mathrm{~s}, 3 \mathrm{~s}, 4 \mathrm{~s}$..., reciting, using music tapes etc. Subtraction and division tables will be taught as the inverse of addition and multiplication.
- Children from 2nd - 4th classes recite their tables regularly and tables are reinforced every day. Children can be encouraged to memorise tables and tables are given every night for homework. Class teachers identify children having difficulties with tables and with them setrealistic targets ensuring steady progression.
- Children will have their tables discretely assessed using teacher observation and weekly tests. Tables are continuously revised in 5th and 6th classes both incidentally through operations of various concepts/ core objectives but also formally throughevaluations and games; "Fuzz Buzz", "Around the World! etc.
- Target Boards can be used to improve children's mental agility and confidence in using a wide range of mathematical vocabulary.
- Tables are practiced incidentally in daily "Master Your Maths" mental exercises.
- Multiplication tables songs are available on www.msaglynn..weebly.com.
- www.topmarks.com : "Hit the Button" is very useful for all tables.
- www.coolsciencelab.com (Math Magician $\times \div$ games for tables


## Appendix 3

Websites recommended by teachers (most are suitable for all age groups):

- www.gillexplore.ie
- www.twinkl.ie
- www.topmarks.com ("hit the button")
- www.khanacademy.org
- www.teachingmoney.co.uk
- www.teacherled.com
- www.mathsisfun.com
- www.twinkl.ie
- www.mathsplayground.com
- www.cjfallon.ie (Busy at Maths activities)
- www.sheppardsoftware.com
- www.ixl.com
- www.counton.org
- www.superkids.com/aweb/tools/math/ (maths worksheet creator)
- www.nrich.maths.org
- www.nzmath.co.nz
- www.youtube.com
- www.worksheetworks.com (free worksheets)
- www.primaryhomeworkhelp.co.uk/maths/countdown/index.htm
- www.coolsciencelab.com (Math Magician $\times \div$ games for tables)
- www.bbc.com
- www.msaglynn.weebly.com : songs for multiplication tables
(Extra websites as recommended by NIPT - National Induction Programme for Teachers)
- www.primarygames.com
- www.nctm.org
- www.pbskids.org
- www.mathsphere.co.uk
- www.mad4maths.com/teachers/links
- www.haveyougotmatheyes.com
- www.clareed.ie/resources
- www.geogebra.org/trac/wiki//Primary

