Mathematics School Plan

Aims:

The aim of our Maths policy is to implement and adopt the aims and objectives of the Mathematics Curriculum.

Mission Statement:

St. Joseph's N.S. will use the Maths Programme as such:

1. To equip the children with mathematical skills and understanding to apply acquired knowledge, to make informed choices and decisions, to predict and hypothesise, and to use deductive reasoning to eliminate or conclude.

2. To develop the children's confidence in Maths and apply this to mathematical tasks in everyday life.

3. To enable every child to use mathematical language and acquire mathematical concepts and processes to their appropriate level of development and ability in preparation for secondary school.

4. St. Joseph's N.S. will endeavour to educate each child at their own level, designing appropriate mathematical tasks for them that are suitable and possible within the classroom situation, taking account of different learning styles and abilities.

5. To provide children with positive, stimulating, and interesting mathematical experiences which have application to everyday life.

Learning Environment

As part of our introduction to the new Primary Maths Curriculum 'Ronda's four freedoms' will be adopted in all classrooms in St. Joseph's. These freedoms will be taught explicitly to the children and will be referred to regularly to create a positive learning environment for all.

➢ Freedom to make mistakes
➢ Freedom to choose your own methods
➢ Freedom to ask questions
➢ Freedom to think for yourself

Appropriate Language:

In relation to each of the strands of the curriculum:

Early Mathematical Activities (Infant level)

Number,

Algebra,

Shape and Space,

Measures,

Data,

We endeavour to standardise the language we use as teachers to describe various processes of thought and activity, especially in relation to the core concepts of number. We feel that by constant building throughout the student's time in the school, they will become familiar with the language associated with other key areas. We will be conscious of this and we will have a print rich environment in our school. In this way we will introduce each child in their class group to a variety of mathematical expressions relevant to the development stage of each child/group.

As a staff we have decided to standardise the following language:

➢ **Place Value:** We will use the words '*units*' (instead of '*ones*') and each teacher will use the word 'digits' frequently.

➢ **Subtraction**: We will use the words *minus, less than, take away, subtract, take from*, *what is the difference between*. For sums involving subtraction, we have decided to start each sum at the top. This will begin in first class and will be reviewed as necessary.

➢ **Addition**: We will emphasise the words *total, altogether, plus, add, increase, more than, sum, total.*

➢ **Multiplication**: We will emphasise the words *multiply, times, by.*

➢ **Division**: We will emphasise the words *divide by, share, into.*

Calculators:

Calculators will be used on a phased basis **from Fourth class**, and each child will bring in their own calculator. They are useful in:

- Handling large numbers
- Checking answers
- Exploring the number system

- Removing computational barriers for some children thus enabling them to focus on the structure of the problem-solving questions at hand.

Children will be shown how to use them properly. It is important that the skill of estimation is developed along with the use of the calculator so that an incorrect calculation can be identified.

Tables:

It is school policy that each child who has the ability to do so, should develop the capacity to recall and be able to recite tables appropriate to their age level. These are to be constantly revised and checked by the class teacher.

In relation to classes the number **facts up to 12** should be learned on the following basis:

- 1st Class... Addition and Subtraction
- 2nd Class... Addition and Subtraction
- 3rd Class... Multiplication and Division
- 4th Class... Multiplication and Division
- 5th and 6th Classes... Revision of the above.

Methodologies/ Pedagogical Practice:

As a staff we have decided to implement and adopt the methodologies outlined in the Teacher Guidelines 1999 from **page 30 onwards**. We will emphasise the '*active learning*' approach coupled with the '*hands-on approach*' encouraging the use of concrete materials, whenever possible. We will be aware of the need to discuss (rather than just teacher/pupil question and answer), theorise, hypothesise, tackle, measure, estimate, calculate, check, etc. We will be aware of the need to teach the children the skills involved in such discussions such as turn-taking, respecting other people's ideas and opinions and so on.

- **Promoting Maths Talk**

  As a school, we have decided to focus on Promoting Maths Talk as an introduction to the New Primary Maths Curriculum. Maths Talk is a collaborative process where children's thinking, strategies and ideas are expressed, shared and/or exchanged. This allows children to:

  - Reflect on their own understanding
  - Define, present, and justify their ideas

- Make sense of and critique their own ideas and those of others
- Develop their ability to express and articulate their thinking

Some of the strategies that we will adopt are 'Let's Talk Maths' and 'Number Talk'.

Textbooks:

In St. Joseph's N.S. we use the 'Busy at Maths' series. This textbook will provide a valuable support for the different strand areas of the curriculum. It is used as a resource and it is not expected that all pages will be complete. Shadow books and testing apparatus may be 'dipped into' as needs arise.

PDST manuals:

As a school, we utilise the PDST manuals to aid in our planning for the Teaching and Learning of Mathematics. There are hard copies available in the 'Shared Resource Press' and they are also accessible online.

Maths Week:

In St. Joseph's N.S. we celebrate Maths Week Ireland in October annually. Maths Week is an important way to help learners, of all ages, enjoy maths and to highlight the creativity of the subject. Some of the activities that we engage in each year may include:

➢ Maths for Fun
➢ Maths games
➢ Maths trails
➢ 'Maths Eyes'

Assessment Procedures:

- Teacher designed tasks and tests: following up on various areas strand units and tests.
- Diagnostic test results: if a teacher has a worry about a specific child's response to an area, topic or concept, they can, in conjunction with the Resource or Learning Support Teacher, prescribe specific testing and analysing of a child's errors. This should help in planning further units of work.
- Standardised testing using the '*Drumcondra Primary Maths Test* will take place in May of each year.

- Records will be retained in teacher's assessment folders or in individual children's folders as required.

Maths Homework:

Homework will be used to re-enforce work done in school where the pupil can use some of the skills learned at school in his own environment. Homework tasks should be realistic, practical and relevant.

Timetabling:

Maths will be taught for a minimum of 4 hours per week in the senior classes and for 3 hours in the infant classes.
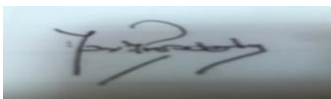
Differentiation:

This Mathematics programme aims to meet the needs of all the children in the school. This will be achieved by teachers varying the pace, content and methodologies to ensure learning for all pupils. This will be evident in the teacher's preparation for Teaching and Learning (invisible, visible and recorded)

The requirements of children with special needs will be taken into account when planning class lessons and related activities. The S.N.A. supports particular children and groups as directed by the class teacher. Children who experience bereavement and loss, serious illness, or other major personal situations are supported and consideration is given to meeting their individual needs in the most appropriate manner.
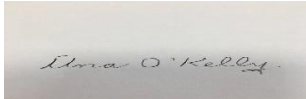
Implementation & Review

The implementation of the School Plan is supported by all staff and the BOM of St. Joseph's N.S. It will be reviewed as necessary.

Ratified by BOM on the 25th April 2024.

Signed: David Powderly

Chairperson BOM

Signed: Úna O' Kelly

Principal

Appendices

1. Subtraction & Re-grouping

2. Problem Solving

3. Maths Trail

4. Number Operations

5. Maths Resources / equipment

6. Thinking Strategies and Addition Facts (Tables)

7. Thinking strategies and Multiplication Facts (tables)

8. Calculator Activities

9. Useful Mathematical Websites

10. Glossary of mathematical terms to support the Mathematics Primary School Curriculum

Appendix 1: Subtraction with Regrouping.

When subtracting, or taking away, all pupils, parents and teachers are requested to use the following agreed wording.

$$
\begin{array}{cc}
T & U \\
5 & 1 \\
-\underline{2} & \underline{3}
\end{array}
$$

51 take away 23 or 51 minus 23
We begin with the unit side.

RULE: always start at the top.

1 take away 3 we cannot do
So we rename a 10 from the 10's side

How many tens do we have now?   4

How many units do we have now?   11

$$
\begin{array}{cc}
T & U \\
4 \\
\cancel{5} & 1 \\
-\underline{2} & \underline{3}
\end{array}
$$

(Remember to begin with the units)
11 take away 3. What does that leave?
11 take away 3 leaves 8
(Now subtract the tens)
4 take away 2. What does that leave?
4 take away 2 leaves 2

$$
\begin{array}{cc}
4 \\
\cancel{5} & 1 \\
-\underline{2} & \underline{3} \\
2 & 8
\end{array}
$$

We had 51 and we took away 23
Now what have we left?
We have 28 left.

What is a problem?

A task is perceived as a problem when the pupil is uncertain about its solution. The ability to solve problems is at the heart of maths. Maths is only useful to the extent to which it can be applied to a particular situation and it is the ability to apply maths to a variety of situations to which we give the name 'problem solving'.

Types of Problems:

- Word problems
- Practical tasks
- Open-ended investigations
- Puzzles
- Games
- Projects
- Mathematical trails

Strategies used / available:

- Making an estimate
- Constructing a model
- Drawing a diagram
- Making a chart or table of information
- Look for patterns in a problem
- Make a guess and test it out
- Breaking a problem down and solving each part
- Write a number sequence for the problem
- Use appropriate materials
- Solve a simpler version of the problem
- Act out a problem
- RUCSAC approach to problem solving

What is a maths trail? A way of using the environment to explore some maths.

Why do a maths trail? Fun and enjoyment; To see some mathematic s in the environment; To encourage observation. As starting points for classroom activities; For its cross curricular possibilities; Maths trails are mentioned in the non-statutory guidance!

Where can a maths trail be set up?
School (classroom, hall, gym, library, corridor, school ground etc.); Local vicinity, village, part of town or city, shopping centre, park, countryside, Church, cathedral, Museums, stately homes etc.

In considering the venue for your trail you may need to think about
How busy will the area be at times when children will be on the trail? Are the features you want the children to look for easily seen at these times? Is it safe for your children? Is there sufficient space for all your children? Does it need to be traffic free? Could the number of children in such an area cause a nuisance to other people?

How can it be organised?
Is it going to be a trail suitable for various age and ability ranges? If so, you may need to choose objects or places where different levels of questioning would b possible. Will the whole class do the trail at the same time or not? Will the children work individually or in pairs or in groups…? Is it going to be a trail which is completed in one "go" or one which could be split into several sections? Are you going to use other teachers, parents, helpers?

How can it be presented?
A series of questions in the order in which they must be done? Direct instructions of where to go to next? Clues about where to go next? A map or plan? Path drawn in or areas marked in some way? Questions which can be attempted in any order? Answers written on the sheet/booklet or on a separate piece of paper?

What types of questions are you going to ask?
All of which can be answered "on trail" Some questions or ideas taken back to be developed further? Some starting points for activities? Closed questions, open questions or a mixture? Questions which deal with various aspects of maths? (Is it important to have a variety?) Could the children to think of some questions themselves? When are you going to ask them to do this? Questions which ask the children to "collect" things whilst on the trail?

How do you organise helpers? What will you expect of them? Will they work alongside the children, will they support the children or will they merely act as adult supervisors? Will you meet with them beforehand?

Other considerations: Transport arrangements; The things children will need on the trail e.g. writing materials, a bag in which to collect items; Insurance, parental consent.

+

addition
total
sum of
increase
add
and
more than

−

subtraction
decrease
subtract
take away
difference
less than
minus

X

multiplication
multiply
times
of
product of
power of
square

÷

division
divide
split
group
share
how many
give

=

Equals
means
will be
Is
represents
answer is
Same as

Appendix 5: Maths Materials

Early Maths Activities
Sorting Animals/Trays
Bears
Links
Beads
Pegs and Pegboards
Interlocking Cubes
Buttons (varying holes)
Matching Games
Magnetic Numbers
Dice
Number Lines
Dominoes
Sorting vehicles
Dienes Blocks
Cuisenaire Rods
Pattern Blocks
Logic Attribute Blocks
Tangrams
3D shapes/polygons
Shape puzzles
Geoboards
Dot/Isometric Paper
Construction blocks
Counters
Lollipop sticks
Number fans
Flashcards

Shape and space strand
2D shapes
3D shapes
Construction Straws
Pattern blocks
Geoboards
Nets of 3D shapes
Geostrips
Tangrams
Pentominoes

Measures strand
Balancing scales
Electric scales
Plastic weights
Dominoes
Empty containers for measuring
Plastic money
Large and small clocks
Trundle wheels
Metre sticks
Counting sticks

Number Strand
Dice
Unifix cubes
Number Lines
Place value boards
Dienes blocks
Counters
100 squares
Lollipop sticks
Interlocking cubes
Dominoes
Games
Calculators
Number fans
Playing cards
Cuisenaire rods
Fraction walls

Algebra Strand
Peg boards
Directed Number lines
100 squares

Add 0, 1, 2
Counting on: Children can count on 1 or 2 more without overloading their memory

Commutative Property:
e.g., 2+3 = 3+2
Children need to understand the commutative property of addition.

Adding 10
e.g., 10+6, 10+8 etc.

Subtraction
is the inverse of addition

Doubles
e.g., 5+5, 8+8, 4+4
It is very important for children to know their doubles in order to allow work to be done on near doubles. This is also a good forerunner to multiplication.

Near doubles
This is any sum, which is one way from being a double sum.
e.g., 8+9, 4+3 etc.

Facts of ten*
e.g. the numbers that make 10: 6+4, 3+7, 9+1 etc.

Adding to 9*:
One less than 10

Through10*
Also called bridging the ten

*The ten frame can be used to teach these three groups.

Repeated Addition

Get the children to make up 3 groups of 5 using cubes. 5+5+5=15 or groups of 5 is 15

Skip counting

This can be done concretely on the number line or the hundred square before moving towards oral work.

Commutative property

e.g., 4x6=6x4

Doubles

Doubles in the multiplication tables means 2x2, 6x6, 9x9 etc.

One set more/less

This is a great way to teach 6/4 times tables but the fact of 5 must be taught first.
Therefore, when introducing the 6 times tables they are introduced as one set more than 5, i.e., 5 times 8 is 40 so 6 times 8 is 40+8. In the same way the four times tables can be introduced as on set less.

10's tables to teach 9's

9 groups of a number is one set less than 10 groups of the number, i.e. 9x8 is the same as 80-8.

Twice a known Fact

4x7; 2 seven is 14 so twice as much is 28. This can be a useful way of teaching parts of the 4, 8 and 6 times tables.

Appendix 8: Calculator Activities

Number Patterns (Multiplication and Division)

Multiplication
Enter 6; Press +; Press =; The multiples of 6 should come up

Division
Enter 72; Press –; Enter 8; 72 should be reduced by 8 each times. This will also go into negative numbers.

Wipe out

Key in 8476. Wipe out in order starting with the units.
How did you wipe out the 6 units? What number have you now got?
How will you wipe out the 7? What numbers have you got? Etc.

Zap the Digit

Key in 764. Reduce the number to 0 in any order you like. Compare your method with the person beside you.

Oral Maths & Estimation Skills

Key in 764. Change this number to 28
(a) Change this number any way you like using any numbers/operations.
(b) Change using the fewest keys possible.

No More or Less

Pick a start number 3 5 8 10; Pick and end number 0 30 75; Try to reach it in 4 steps, no more, no less. Use your calculator to check your answer.

Hit the Target

Think of a two digit "target" number. What two numbers can be added together to make the target number. 98 (45+53) (40+58) (30+68)

Two Tries

Pick a target number from the following 1500,2000,3500,4000,5500
Select 4 digits. Rearrange the digits to get close to your target number when you multiply.
__x_____=1500 Check your answer on the calculator.

Broken Key

The 9 key is broken. Complete this sum on the calculator without using the broken key. 24 x 4 =

Multiplication Target
Using only these keys 2,3, X =. Target (reach) these numbers 6,8,9,36

Hat Trick

Estimate which sum matches the answer. 16 X 4; 19 X 3; 24 X 5;   120   64   47

Developing estimation skills

Play a version of the numbers game from 'Countdown'. Give the pupils a range of numbers and ask them to reach a certain target.

Number sense

2,3,6,8,12 reach 60 using all numbers, using some members, any, some, no operations

Checking calculations

$$
\begin{array}{r}
25 \\
\underline{X34} \\
100 \\
\underline{+750} \\
850
\end{array}
$$

Appendix 9: Useful Mathematics websites

www.pmc.oide.ie
www.mathigon.org
www.ncca.ie
www.seomraranga.com
www.aaamath.com
www.puzzlemaker.com
www.funbrain.com
www.teachingideas.co.uk
www.scoilnet.ie
www.primaryscience.ie
www.primarygames.com
www.multiplication.com
www.barryispuzzled.com
www.teachingandlearningresources.co.uk
www.teachingideas.co.uk
www.senteacher.org
www.teachingtime.co.uk

<u>Glossary</u>

These descriptions are intended to be a help to primary teachers and are not necessarily the full mathematical definitions of the term.

algorithm	a logical, arithmetical or computational procedure that, if correctly applied, ensures the solution of a problem
analogue clock	a clock on which hours, minutes and sometimes seconds are indicated by hands on a dial
area	a unit of area equal to 100 square metres
associative	an operation such as multiplication or addition is associative if the same answer is produced regardless of the order in which the elements are grouped, e.g.(2 +3) + 5 = 10, 2 + (3 + 5) = 10
cardinal number	a number denoting quantity but not order in a set
commutative	giving the same result irrespective of the order of the elements in addition and multiplication 6 + 2 =8 2 + 6 = 8, 5X7=35 7X5=35
composite number	a number with more than two factors that is not a prime number, e.g. 6, 10
denominator	the divisor in a fraction
diameter	a straight line connecting the centre of a circle with two points on the perimeter
distributive	the same result is produced when multiplication is performed on a set of numbers as when performed on the members of the set individually, e.g. 5 x 4 = (3 + 2) x 4 = (3 x 4) + (2 x 4)
dividend	a number or quantity to be divided by another number or quantity divisor a number or quantity to be divided into another number or quantity
equation	a mathematical sentence with an equals sign
hectare	a unit of area equal to 100 ares
line symmetry	a shape has line symmetry if one half of the shape can be folded exactly onto the other half

Number sentence   an equation or statement of inequality

numerator   the number above the line in a fraction

ordinal number   a number denoting relative position in a sequence, e.g. first, second, third

perimeter   the sum of the length of the sides of a figure or shape

prime factor   a factor that is a prime number

prime number a whole number that has only two factors, itself and 1, e.g. 2, 3, 7

radius   a straight line from the centre of a circle to a point on the circumference; a radius is half the diameter

ratio   the relationship between two numbers of the same kind;
e.g. the ratio of 2 kg to 6 kg is 2:6

subitise   tell at a glance, without counting, the number of items in a set

subtrahend   the number to be subtracted from another number,
e.g. 10 - 4 (4 is the subtrahend)

tessellation   shapes tessellate if they fit together exactly, form a repeating pattern, and make an angle of 360 degree at the points of contact

variable   a letter or symbol that stands for a number, e.g. $y + 7 = 12$

B.O.M.D.A.S.	Brackets Order Multiplication Division Addition Subtraction
D.C.U.	Dublin City University
D.E.S.	Department of Education & Science
E.F.L.	English as a foreign language
I.C.T.	Information & Communication Technology
N.C.C.A.	National Council for Curriculum & Assessment
N.C.S.E.	National Council for Special Education
P.T.A.	Parent Teacher Association
S.E.N.	Special Educational Needs
S.E.T.	Special Education Teacher
S.N.A.	Special Needs Assistant
STen	Standard ten score
V.A.T.	Value Added Tax