

# MATHEMATICS POLICY



*Scoil na mBuachaillí*

*(Clonakilty Boys National School)*





## AIMS / PURPOSES

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- a) To develop a positive attitude towards mathematics and an appreciation of both its practical and its aesthetic aspects.
- b) To develop problem-solving abilities and a facility for the application of mathematics to everyday life.
- c) To enable the child to use mathematical language effectively and accurately.
- d) To enable the child to acquire an understanding of mathematical concepts and processes to his appropriate level of development and ability.
- e) To enable the child to acquire proficiency in fundamental mathematical skills and in recalling basic number facts.

*Taken from the 'New 'Curriculum Book page 12*

## PROCEDURES/GUIDELINES

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### Approaches

The following approaches and methodologies will be used by teachers in delivering our mathematics programme:

#### ❖ Emphases on guided discussion

- Children must be trained in discussion skills before they can effectively use them in a group
  - Turn-taking
  - Active listening
  - Positive response to the opinions of others
  - Confidence in putting forward an opinion
  - Ability to explain clearly their point of view

❖ **Hands-on approach from infants to sixth class**

❖ **Mathematical Language**

- A common approach will be adopted.
- In Subtraction - we will always *take the bottom from the top.*  
(*Explaining that we are taking the small number from the big number*) *The Decomposition method will be used.*

❖ **Tables**

- When learning tables children will say for example:  
6 - 4 = four from six equals two
- Tables will be learned up to 12.

❖ **Estimation strategies for number**

- Estimation Procedure - *Estimate first, write down your estimate, solve the problem, compare your estimate with the actual result.*
  - Different strategies will be used -
  - *Front-end strategy*
  - *Clustering strategy*
  - *Rounding strategy*
  - *Special Numbers Strategy*

❖ **Problem Solving**

- Children need to develop problem-solving skills in general and to be confident in their own ability to attempt a solution. The following strategies will be taught (when approaching a problem):
  - *Construct a model*
  - *Drawing a diagram to illustrate a problem*
  - *Making a chart or table of the information*
  - *Looking for patterns in a problem*
  - *Making a guess and testing it out*
  - *Breaking the problem down and solving each part*
  - *Writing a number sentence for the problem*
  - *Using appropriate equipment to solve the problem*
  - *Solving a simpler version of the problem.*

❖ **Paper-folding and fractions**

❖ **Early Mathematical activities**

❖ **Place Value Notation Boards**

❖ **Integration, Linkage and Cross-Strand Planning**

- **Integration** - a cross curricular approach
- **Linkage** - Integration within mathematics
- **Cross-strand planning**

❖ **Using Technology**

- **Calculators** - children must be ready before they use calculators. There will be approx. 60 calculators available for use (*i.e. two class sets, kept in the Resources Room*).  
Children will be taught how to use a calculator from the start -  
In **Rang 4** the following will be taught -

**+, -, x, ÷, =, decimal point, C.CE**

In **Rang 5/6** the following will be taught

All of the above - revised and  
**M+, M-, +/-, %, R.CM**

- **Calculators** will not be used for homework, unless directed by the teacher.
- **Information Technology** - as with calculators children must become more discerning about when it is appropriate to use ICTs to solve a problem and which element of that technology will be of most use to them. Computers may be used for creating pie charts, bar graphs, etc. Also various software packages may be used to consolidate work done heretofore or to create worksheets etc.



Calculators used in the school

❖ **Pupils with Special Needs/Individual Difference**

- Children with Special Needs will not always be able to work on their own, but may be able to work with partners. Lessons can also be done by the Resource teacher where the lesson could be tailored to the child's individual needs.
- An Individual Education Programme will be devised by the Resource Teacher to suit the needs of pupils attending these classes - *emphasis on number, time and money*.
- The work will be tailored to the child's needs - the strands of Number and Measures will be emphasised.
- Children who are very good at mathematics - will be challenged with Worksheets (with more difficult or taxing problems), work cards, computer work/software. They will also be encouraged to design their own games.

**Symbols, numerals, fractions and terminology (continued)**

<b>3 - D Shapes</b>	<b>Junior Infants</b>		Vocabulary of time	
	<b>Senior Infants</b>	Cube, cuboid, sphere, cylinder	Read time in one-hour intervals	
	<b>Rang 1</b>		Read time in half-hour intervals	
	<b>Rang 2</b>	Cone	Read time in quarter-hour intervals	
	<b>Rang 3</b>	Triangular prisms, pyramids	Read time in five-minute intervals	
	<b>Rang 4</b>			
	<b>Rang 5</b>	Tetrahedron	24-hour clock	
	<b>Rang 6</b>	Octahedron		

## Symbols, numerals, fractions and terminology

	Junior Infants	Senior Infants	Rang 1	Rang 2	Rang 3	Rang 4	Rang 5	Rang 6
<b>Symbols</b>		+ =	- Frame cent	< > €	X ÷ Decimal point		% Degree °	Positive and negative notation +2 -5 Exponent 4 <sup>2</sup>
<b>Numerals</b>	0 - 5	6 - 10	to 99	to 199	to 999	to 9999		
<b>Decimals</b>					One place of decimals 0.1 <sup>1</sup> / <sub>10</sub>	Two places of decimals 0.01 <sup>1</sup> / <sub>100</sub>	Three places of decimal 0.001 <sup>1</sup> / <sub>1,000</sub>	
<b>Fractions</b>			<sup>1</sup> / <sub>2</sub>	<sup>1</sup> / <sub>4</sub>	<sup>1</sup> / <sub>8</sub> <sup>1</sup> / <sub>10</sub>	<sup>1</sup> / <sub>3</sub> <sup>1</sup> / <sub>5</sub> <sup>1</sup> / <sub>6</sub> <sup>1</sup> / <sub>9</sub> <sup>1</sup> / <sub>12</sub>		
<b>Measures</b>			Metre Litre Kilogram	Centimetre	Gram Millilitre	Kilometre m <sup>2</sup> , cm <sup>2</sup>	Millimetre	Ares Hectares
<b>2-D Shapes</b>	Square, circle, rectangle, triangle		Semi-circle	Oval	Hexagon	Parrallogram, rhombus, pentagon, octagon, triangles: <i>equilateral, isosceles, scalene</i>	Quadrilateral, trapezium	

- Calculators may be used by children with Special Needs - if the class teacher/Resource/Learning Support Teacher decides that it is the child's best interest.

### ❖ Textbooks

- Textbooks / Workbooks will be evaluated when they are all available and a copy of each one will be kept in the Teacher's Library.

### ❖ Homework in Mathematics

- Homework is important in Mathematics as it
  - provides a link between home and school.
  - allows the child to work independently.
  - reinforces the work done in the classroom.
- It must be stressed that homework in Mathematics can also be re-research, looking at a TV programme etc.
- Learning tables *by heart* will still be given as homework.

### ❖ Home/School Links

- Communication between parents and school is very important in the area of mathematics. From time to time *Links* will be used to inform parents.

### ❖ The Mathematics Area

- When appropriate a mathematics area may be set up in the classroom which could be used by the children to experiment and display their results or for displaying charts, holding workcards/worksheets etc.
- Parts of the class could also be labelled with heights, areas etc.
- The corridor will be used to display number lines etc.

### ❖ Maths in the Senior Classes

- There will be continued use of manipulatives plus the use of computers and calculators where appropriate.

### ❖ Mathematics Copies

- From Junior Infants to Rang 1 the children will use cm<sup>2</sup>.
- From Rang 2 - Rang 6 the children will use regular maths copies.
- From Rang 3 onwards children will layout their copy as follows:
  - Divide the page into two using red biro.
  - Label all work - date, book, question etc
  - At the end of the sum/problem write either *Ans./Frg.*

### ❖ Subtraction

- Ranganna will use the *regrouping* method. (*Decomposition*)

### ❖ Long Division

- Children in Rang 4 will prepare for Long Division towards the end of the final term in that class.

The following is a brief outline of the **Strands** and **Strand Units** in the Mathematics Curriculum.

<i>OVERVIEW OF THE MATHS CURRICULUM</i>					
<i>SKILLS DEVELOPMENT</i>		<i>INF.</i>	<i>1ST 2ND</i>	<i>3RD 4TH</i>	<i>5TH 6TH</i>
<i>1. Skills</i>	❖ Applying and problem-solving	√	√	√	√
	❖ Communicating and expressing	√	√	√	√
	❖ Integrating and connecting	√	√	√	√
	❖ Reasoning	√	√	√	√
	❖ Implementing	√	√	√	√
	❖ Understanding and Recalling	√	√	√	√
<i>STRANDS</i>	<i>STRAND UNITS</i>				
	<i>Infants</i>	<i>Rang 1 &amp; Rang 2</i>	<i>Rang 3 &amp; Rang 4</i>	<i>Rang 5 &amp; Rang 6</i>	
<i>EARLY MATHEMATICAL ACTIVITIES</i>	❖ Classifying ❖ Matching ❖ Comparing ❖ Ordering				

### Overview of Skills Development (continued)

	<b>Applying and problem-solving</b>	<b>Communicating and expressing</b>	<b>Integrating and connecting</b>	<b>Reasoning</b>	<b>Implementing</b>	<b>Understanding and recalling</b>
<b>Rang 3 &amp; Rang 4</b>	<ul style="list-style-type: none"> <li>• Select appropriate materials and processes for mathematical tasks and applications</li> <li>• Analyse problems and plan an approach to solving them</li> <li>• Select and apply a variety of strategies to complete tasks/projects or solve problems</li> <li>• Evaluate solutions to problems.</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss and explain the processes used or results of mathematical activities / projects / problems</li> <li>• Discuss and record processes and results using a variety of methods</li> <li>• Discuss problems presented orally, pictorially or diagrammatically; carry out analyses</li> </ul>	<ul style="list-style-type: none"> <li>• Connect informally acquired mathematical ideas and processes with formal mathematical ideas and processes</li> <li>• Understand the connections between mathematical procedures and concepts</li> <li>• Represent mathematical ideas and processes in different models: verbal, pictorial, diagrammatic, symbolic</li> <li>• Recognise and apply mathematical ideas and processes in other areas of the curriculum</li> </ul>	<ul style="list-style-type: none"> <li>• Make hypotheses and carry out experiments to test them</li> <li>• Make informal deductions involving a small number of steps</li> <li>• Explore and investigate mathematical patterns and relationships</li> <li>• Reason systematically in a mathematical context</li> </ul>	<ul style="list-style-type: none"> <li>• Execute standard procedures efficiently with a variety of tools</li> </ul>	<ul style="list-style-type: none"> <li>• Understand and recall terminology, facts and definitions</li> </ul>
<b>Rang 5 &amp; Rang 6</b>	<ul style="list-style-type: none"> <li>• Reflect upon and evaluate solutions to problems</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss and explain processes and results in an organised way</li> <li>• Discuss problems and carry out analyses</li> </ul>	<ul style="list-style-type: none"> <li>• Search for and investigate mathematical patterns and relationships</li> </ul>			<ul style="list-style-type: none"> <li>• Understand and recall facts, definitions and formulae</li> </ul>

# Overview of Skills Development

	<b>Applying and problem-solving</b>	<b>Communicating and expressing</b>	<b>Integrating and connecting</b>	<b>Reasoning</b>	<b>Implementing</b>	<b>Understanding and recalling</b>
<b>Infant Classes</b>	<ul style="list-style-type: none"> <li>Select appropriate materials and processes for mathematical tasks</li> <li>Select and apply appropriate strategies to complete tasks or solve problems</li> <li>Recognise solutions to problems.</li> </ul>	<ul style="list-style-type: none"> <li>Discuss and explain mathematical activities</li> <li>Record results using diagrams, pictures and numbers</li> <li>Discuss problems presented pictorially or orally</li> </ul>	<ul style="list-style-type: none"> <li>Connect informally acquired mathematical ideas with formal mathematical ideas</li> <li>Recognise mathematics in the environment</li> <li>Recognise the relationship between concrete, verbal, pictorial and symbolic modes of representing numbers</li> <li>Carry out mathematical activities which involve other areas of the curriculum</li> </ul>	<ul style="list-style-type: none"> <li>Classify objects into logical categories</li> <li>Recognise and create sensory patterns</li> <li>Justify the processes/ results of activities</li> </ul>	<ul style="list-style-type: none"> <li>Devise and use mental strategies / procedures for carrying out mathematical tasks</li> <li>Use appropriate manipulatives to carry out tasks and procedures</li> </ul>	<ul style="list-style-type: none"> <li>Understand and recall terminology</li> </ul>
<b>Rang 1 &amp; Rang 2</b>	<ul style="list-style-type: none"> <li>Select appropriate materials and processes for mathematical tasks / applications</li> <li>Apply concepts and processes in a variety of contexts.</li> </ul>	<ul style="list-style-type: none"> <li>Listen to and discuss other children's descriptions / explanations</li> <li>Discuss and record using diagrams, pictures and symbols</li> </ul>	<ul style="list-style-type: none"> <li>Understand the mathematical ideas behind the procedures he uses</li> </ul>	<ul style="list-style-type: none"> <li>Make guesses and carry out experiments to test them</li> <li>Recognise and create mathematical patterns and relationships</li> </ul>	<ul style="list-style-type: none"> <li>Execute problems efficiently</li> </ul>	<ul style="list-style-type: none"> <li>Understand and recall terminology and facts</li> </ul>

<b>STRANDS (CONTINUED)</b>	<b>STRAND UNITS</b>			
	<i>Infants</i>	<i>Rang 1 &amp; Rang 2</i>	<i>Rang 3 &amp; Rang 4</i>	<i>Rang 5 &amp; Rang 6</i>
<b>A. NUMBER</b>	<ul style="list-style-type: none"> <li>❖ Counting</li> <li>❖ Comparing and Ordering</li> <li>❖ Analysis of Number - <i>Combining, Partitioning, Numeration</i></li> </ul>	<ul style="list-style-type: none"> <li>❖ Counting and Numeration</li> <li>❖ Comparing and Ordering</li> <li>❖ Place Value</li> <li>❖ Operations - <i>Addition, Subtraction</i></li> <li>❖ Fractions</li> </ul>	<ul style="list-style-type: none"> <li>❖ Place Value</li> <li>❖ Operations - <i>Addition &amp; Subtraction, Multiplication, Division</i></li> <li>❖ Fractions</li> <li>❖ Decimals</li> </ul>	<ul style="list-style-type: none"> <li>❖ Place Value</li> <li>❖ Operations</li> <li>❖ Fractions</li> <li>❖ Decimals &amp; Percentages</li> <li>❖ Number Theory</li> </ul>
<b>B. ALGEBRA</b>	<ul style="list-style-type: none"> <li>❖ Extending Patterns</li> </ul>	<ul style="list-style-type: none"> <li>❖ Extending and Using Patterns</li> </ul>	<ul style="list-style-type: none"> <li>❖ Number Patterns and Sequences</li> </ul>	<ul style="list-style-type: none"> <li>❖ Directed Numbers</li> <li>❖ Rules and Properties</li> <li>❖ Variables</li> <li>❖ Equations</li> </ul>
<b>C. SHAPE</b>	<ul style="list-style-type: none"> <li>❖ Spatial Awareness</li> <li>❖ 3-D Shapes</li> <li>❖ 2-D Shapes</li> </ul>	<ul style="list-style-type: none"> <li>❖ Spatial Awareness</li> <li>❖ 2-D Shapes</li> <li>❖ 3-D Shapes</li> <li>❖ Symmetry</li> <li>❖ Angles</li> </ul>	<ul style="list-style-type: none"> <li>❖ 2-D Shapes</li> <li>❖ 3-D Shapes</li> <li>❖ Symmetry</li> <li>❖ Lines and Angles</li> </ul>	<ul style="list-style-type: none"> <li>❖ 2-D Shapes</li> <li>❖ 3-D Shapes</li> <li>❖ Lines and Angles</li> </ul>

<b>STRANDS</b> <i>(CONTINUED)</i>		<b>STRAND UNITS</b>			
	<i>Infants</i>	<i>Rang 1 &amp; Rang 2</i>	<i>Rang 3 &amp; Rang 4</i>	<i>Rang 5 &amp; Rang 6</i>	
<b>D. MEASURES</b>	<ul style="list-style-type: none"> <li>❖ Length</li> <li>❖ Weight</li> <li>❖ Capacity</li> <li>❖ Time</li> <li>❖ Money</li> </ul>	<ul style="list-style-type: none"> <li>❖ Length</li> <li>❖ Area</li> <li>❖ Weight</li> <li>❖ Capacity</li> <li>❖ Time</li> <li>❖ Money</li> </ul>	<ul style="list-style-type: none"> <li>❖ Length</li> <li>❖ Area</li> <li>❖ Weight</li> <li>❖ Capacity</li> <li>❖ Time</li> <li>❖ Money</li> </ul>	<ul style="list-style-type: none"> <li>❖ Length</li> <li>❖ Area</li> <li>❖ Weight</li> <li>❖ Capacity</li> <li>❖ Time</li> <li>❖ Money</li> </ul>	
<b>E. ALGEBRA</b>	<ul style="list-style-type: none"> <li>❖ Recognising and interpreting data</li> </ul>	<ul style="list-style-type: none"> <li>❖ Recognising &amp; interpreting data</li> <li>❖ Chance</li> </ul>	<ul style="list-style-type: none"> <li>❖ Recognising &amp; interpreting data</li> <li>❖ Chance</li> </ul>	<ul style="list-style-type: none"> <li>❖ Recognising &amp; interpreting data</li> <li>❖ Chance</li> </ul>	

On pages 10 - 11 you will find **Overview of Skills Development** for the entire school.

On pages 12 - 13 you will find **Symbols, Numerals, Fractions and Terminology** for the entire school.

*Both of these have been taken from the Curriculum Handbook pages 68-70.*

## RESOURCES/IMPLICATIONS

large number of resources will be available in the Resources room. (A list of these is kept in the **Fearas / Inventory** list which is updated regularly). Teachers will also have equipment in their own rooms. Mr. Michael Harte (POR Holder) has responsibility for these resources.

- A supply of copies cm<sup>2</sup> and ordinary ones will be kept in the school shop.
- Safety issues - when using equipment - the safety of the children will

be paramount at all times.

- This policy will be made available to Board of Management, parents and other stakeholders, and copies will be kept in the office.

## Staff Development

Mr. Michael Harte (Post of Responsibility Holder) has responsibility for monitoring new developments in Visual Arts. He will assist teachers if necessary to access to current research, reference books, resource materials, websites dealing with Visual Arts.

## Roles and Responsibilities

Mr. Michael Harte will co-ordinate the progress of the plan, encourage and accept feedback on its implementation and report to staff on findings.

The plan will be monitored at staff meetings (led by Mr. Michael Harte), School Development Planning meetings and occasionally at Board of Management meetings.

All new teachers will be given a copy of this policy by SPHE Coordinator - Mr. Michael Harte (Post of Responsibility holder).

## MONITORING/EVALUATION/REVIEW

The cognitive and affective areas that should be assessed include the following

- Conceptual knowledge and understanding
- Problem-solving ability
- Computational proficiency
- Recall skills
- Mastery of specific content areas
- The ability to communicate and express mathematical ideas and processes
- Attitudes - towards mathematics, including confidence, interest, willingness to take risks, and perception of the usefulness of mathematics.

- Assessment Tools
  - Teacher skills of observation
  - Teacher designed tasks and tests
  - Work Samples, portfolios and projects
  - Curriculum profiles and mastery records
  - Diagnostic testing
  - Standardised testing
  - Pupil profiles

*It is neither practicable or desirable that all these tools be used in every learning situation or within a particular time span.*

A record of pupils work will be kept where appropriate and worthwhile. Teachers will keep their own records on the children's progress. Reporting to parents on children will be carried out as usual through Parent/Teacher Meetings and Reports. This policy to be reviewed at intervals to assess its effectiveness.

*Policy drawn up March 2003*

*Reviewed November 2005 | March 2009*