|  |
| --- |
| **Mathematics Policy**  Description: Description: C:\Users\User\Documents\school crest\boolavogue2 with name.jpg |
| **Rationale**  Mathematic education enables the child to think and communicate quantitatively and spatially, solve problems, recognise situations where mathematics can be applied, and use appropriate technology to support such use. The Mathematics Curriculum emphasises the development of the child’s estimation skills and problem-solving skills using examples which are relevant to the child’s experience  Mathematics education should enable the child to think and communicate quantitatively and spatially, solve problems, recognise situations where mathematics can be applied, and use appropriate technology to support such applications.  The development of numeracy skills is central to the child's life both within and outside school. We believe that these skills are also important for educational and personal success in later life. If the child is to become an informed and confident member of society he/she must be enabled to deal effectively with the varied transactions of everyday life and make sense of the mass of information and data available through the media.  The purpose of this plan is to provide practical guidance for teachers, parents and other relevant persons on the provision of the effective teaching of mathematics in our school. |
| **Vision**  We envisage that in mathematics each child will be given the opportunity to develop their mathematical skills and competencies to their full potential and with the relevant supports in place. We aspire to create an enjoyable mathematical experience for the children where mathematics is seen in everyday life and not just in the classroom.  **Aims**  We endorse the aims of the Primary School Mathematics Curriculum  The aims of the primary mathematics curriculum are   * to develop a positive attitude towards mathematics and an appreciation of both its practical and its aesthetic aspects * to develop problem-solving abilities and a facility for the application of mathematics to everyday life * to enable the child to use mathematical language effectively and accurately * to enable the child to acquire an understanding of mathematical concepts and processes to his/her appropriate level of development and ability * to enable the child to acquire proficiency in fundamental mathematical skills and in recalling basic number facts |
| **Curriculum**   |  |  |  | | --- | --- | --- | | Early mathematical activities (Junior infants only) | * Classifying * Matching * Comparing * Ordering |  | | Number | * **Infant classes** * Counting * Comparing and ordering * Analysis of number *Combining Partitioning Numeration* | * **First and second classes** * Counting and numeration * Comparing and ordering * Place value * Operations *Addition Subtraction* * Fractions | | Algebra | * Extending Patterns | * Exploring and using patterns | | Shape and space | * Spatial awareness * 3-D shapes * 2-D shapes | * Spatial awareness * 2-D shapes * 3-D shapes * Symmetry * Angles | | Measures | * Length * Weight * Capacity * Time * Money | * Length * Area * Weight * Capacity * Time * Money | | Data | * Recognising and interpreting data | * Representing and interpreting data | | Skills | * Applying and problem-solving * Communicating and expressing * Integrating and connecting * Reasoning * Implementing * Understanding and recalling |  | |  | **Third and fourth classes** | **Fifth and sixth classes** | | *Strands* | *Strand units* | *Strand units* | | Number | * Place value * Operations *Addition and subtraction Multiplication Division* * Fractions * Decimals | * Place value * Operations *Addition and subtraction Multiplication Division* * Fractions * Decimals and percentages * Number theory | | Algebra | * Number patterns and sequences * Number sentences | * Directed numbers * Rules and properties * Variables * Equations | | Shape and space | * 2-D shapes * 3-D shapes * Symmetry * Lines and angles | * 2-D shapes * 3-D shapes * Symmetry * Lines and angles | | Measures | * Length * Area * Weight * Capacity * Time * Money | * Length * Area * Weight * Capacity * Time * Money | | Data | * Representing and interpreting data * Chance | * Representing and interpreting data * Chance |   All teachers are familiar with the strands, strand units and content objectives for their class  levels. Curriculum objectives area at the core of each mathematics lesson, and teachers refer to the curriculum objectives in their own planning.  The content objectives are laid out on the following pages in the Curriculum Handbook.  Infant Classes pgs. 20-35  First and Second classes pgs. 40-58  Third and Fourth classes pgs. 64-83  Fifth and Sixth classes pgs. 88-11 |
| **Approaches and Methodologies**  We will use a combination of the following approaches:   * Active learning and guided discovery * Problem solving * Collaborative learning * Use of the environment * Skills development through content   *(See Teacher Guidelines: Mathematics pp. 68-69)*   * + **Applying and problem solving,** *e.g. selecting appropriate materials and processes in science*   + **Communicating and expressing,** *e.g. discussing and explaining the processes used to map an area in geography*   + **Integrating and connecting,** *e.g. recognising mathematics in the environment*   + **Reasoning,** *e.g. exploring and investigating patterns and relationships in music*   + **Implementing,** *e.g. using mathematics as an everyday life skill*   + **Understanding and recalling,** *e.g. understanding and recalling terminology, facts, definitions, and formulae*     **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 on the following pages:  **JUNIOR INFANTS:**  **No signs used**  **Addition:**  Language: and, makes, add, is the same as, altogether makes  **SENIOR INFANTS:**  **Introduction of signs: +, =**  Vocabulary to match this: plus, equals (and, makes initially used as in junior infants)  2  + 1  3  **Top down:**  2 plus 1 equals 3  2 + 1 equals 3  2+1 =3 reads 2 plus 1 equals 3 or 2 and 1 makes 3  **FIRST CLASS**  **Subtraction:**  **- is introduced as a symbol in First class**  Language: take away, less than, left  16  - 4  Vertical: start from the top using the words ‘take away’  16 take away four equals  5 – 1= Horizontal: Read from left to right using the words ‘take away’  5 take away 1 equals  **PLACE VALUE: THE WORD ‘UNITS’ WILL BE USED RATHER THAN ‘ONES’**  **RENAMING/GROUPING WILL BE THE METHOD USED THROUGHOUT THE SCHOOL**  **SECOND CLASS**  **Addition:**  7+3+8= 18 7 plus 3 plus 8 equals 18 (7plus 3 equals 10 plus 8 equals 18)  6  3  +6  6 plus 3 plus 6  encourage 6 + 6 + 3  **Subtraction** Language: subtraction, decrease, subtract, take away, from, less  than, minus, difference  27  -18  7 take away 8 I cannot do so I change a ‘ten’ to ten units, 7+10=  17. 17 take 8 equals 9. 1 take away 1 leaves O.  **THIRD CLASS/ FOURTH CLASS**  **Rounding:**  1, 2, 3 and 4 hey, ho, down we go  5, 6, 7 8 and 9 hey, ho up we go  Half way there which way we go?  Round me up hey, ho, ho.  **Multiplication/**  **Division**  **Short**  **multiplication**  **Long**  **multiplication**  **÷ and x are introduced as symbols in Third Class.** The following  vocabulary will be used:  ÷ division, divide, divided by, split, share, shared between, group,  how many in …  X multiplication, multiply, times, of  Start with 4 groups of 3 move onto…  4 threes  4 times 3  4 multiplied by 3  from bottom  from bottom  Units first. Language as above.  **Multiply by 10**  **Multiply by**  **100**  Add a zero  Add two zeros  **Division** Language: Divisable by/ not divisable by, share among  12 ÷ 4  ÷,  , ,  all used  12 shared among 4  12 divided by 4  **Fractions**  ¼ of 32  7/2  Share 32 among 4 and/or 32 divided by 4  7 divided by 2  ½ is equivalent to 2/4 (4th class)  ½ is the same as 2/4  ½ is equal to 2/4  **Decimals** 1/10 is equal to 0.1 1/100 is equal to 0.01  ***Include zero before decimal point***  **Tesselation** Fit together with no spaces  **FIFTH/SIXTH CLASSES**  **Number:**  **Multiplication/Division**  Language: square, prime, composite, rectangular numbers.  Finding common multiples by listing numbers  Finding common factors by listing factors  The words ‘product’ and ‘quotient’ are introduced. Problems  involving sum, difference, products, quotients  **Fractions: All children are taught to MEMORISE TABLE OF**  **EQUIVALENT FRACTIONS, DECIMALS AND PERCENTAGES**  **(see attached)**  Numerator, denominator  ½ + ¼ = **\_\_ + \_\_ \_\_**  **4 4 = 4**  ½ - ¼ **\_\_ \_ \_\_ \_\_**  **4 4 = 4**  Mixed numbers  + and –  3 ½ - 1 ¾ =  Multiplication  1 X 1  3 5  Multiply top number by top number  Bottom number by bottom number  Simplify/ break down  Division of whole  number by fraction  5 ÷ ¼ =  Change your whole number into a fraction and turn your second  Interactive board very  valuable resource in  teaching fractions  fraction upside down and multiply.  How many quarters in 5 units 5 X 4 = 20  Visual aids used by teacher 1 1  **Decimals** 1/10, 1/100, 1/1000 – tenths, hundredths, thousandths  Addition  Subraction  Rounding decimals  Multiplication of  decimals  Division by decimals  Converting a fraction to  a decimal  to 3 decimal places (with/without calculator)  to 3 decimal places (with.without calculator)  to the nearest whole number  to 1 decimal place  to 2 decimal places.  Multiplying a decimal by a whole number  Multiplying a decimal by a decimal  Count the numbers behind the decimal points in the question and  make sure that there are the same amount of numbers behind  the decimal point in the answer.  Multiply the divisor by 10/100 to change to whole number. If you  multiply the divisor by 10/100 you must multiply the quotient by  10/100.  You divide the numerator by the denominator ( divide the top by  the the bottom)  or  if possible you change the number to tenths/ hundredths and  then convert to decimal. Look out for ½, ¼, 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  Subtraction  Add minutes to minutes  Hours to hours and simplify (changing minutes to hours)  hrs. mins. hrs. mins.  3 15 2 75  -2 33 - 2 33  If minutes number is bigger on the bottom line, convert… Take  hour and change to 60 minutes. Add to other minutes and rewrite  sum.  **Co-ordination** Introduce (x,y) axis  Explain **x** comes befor **y** in the alphabet. This will help them  remember which comes first.  **Area *Rectangle/ square***  Length x width (l x w). breadth = width  Ares (1 Are = 100m, 1 hectare = 10,000m )  Relationship of sq.m to sq.cm.  Area of room from scale plan  ***Surface area***  Find the area of one face. Count the faces and multiply by no. of  faces.  Cube and Cuboid  **Circle** Radius, diameter, circumference, arc, sector,  Relate the diameter of a circle to its circumference by  measurement. Measure the circumference of a circle using a  piece of string.  Construct a circle of given radius/diameter  Examine area by counting squares.  **Length**  ***Irregular Shapes***  Look for regular shapes. Divide the shape and draw diagrams.  Add areas a, b and c.  **Lines and Angles** Right angle, acute, obtuse, reflex, straight, degrees, protractor,  ruler  **2D shapes**  **3D shapes**  Sum of the angles in a triangle = 180  Sum of the angles in a quadrilateral = 360  Sum of angles in a circle = 360  Identify regular tetrahedrons, nets, construct  **Tables**  Number facts up to 10 will be memorised. Addition facts up to 10 will be memorised by the  end of Second Class and multiplication 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: 3x 3 = 9 (three threes nine), 4x3=12 (four threes  12), 5x3=15 (five threes fifteen). All teachers are expected to teach tables this way in order  to ensure consistency and avoid confusion as children mover from one class to the next.  A variety of methods will be used including counting 2s, 3s, 4s …, reciting, using music  tapes etc. Subtraction and division tables will be learned as the inverse of addition and  multiplication.  *Children from 2nd – 6th classes recite their tables regularly and tables are reinforced every*  *day. Children are encouraged to memorise tables and tables are given for homework. Class*  *teachers identify children having difficulties with tables and with them set realistic targets*  *ensuring steady progression. These children will have their tables discretely asked every day*  *and are rewarded when targets* |
| **Assessment and Record Keeping**  (See Curriculum pp. 114-121, Teacher Guidelines pp. 64-65)  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. 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   + Ongoing teacher-designed tests. Children will bring the tests and the results of such tests home for signing. Test results are kept by the class teacher and passed on to the next teacher.   + 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 at the end of May from 1st - 6th class 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. In accordance, with the numeracy and literacy strategy 0007/2012, standardised test results at the end of 2nd, 4th and 6th are made available to the Board of Management and the DES at the end of each school year.   Following assessment teachers may do the following:   * + Give extra help to individual 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 the child in an informal way.   + Consult with the Learning Support Teacher who will provide support when needed using available resources within the school. |
| **Differentiation**  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.  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. If a child is already attending the Learning support teacher for English, it may be possible, on occasion, for the child to receive some help with his/her Maths work as part of the supplementary teaching sessions.  Children with exceptional ability in Maths will be given extra work based on the concept being taught in class and in our multigrade setting will be allowed to work with the next class level for the subject area of maths. 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. courses through DCU.  Teachers should keep a record of the differentiated approach adopted for these children. |
| **ICT**  Calculators  Calculators are used in our school as aid to the teaching of maths 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.  Calculators should meet the following requirements:  • If parents wish to buy a calculator they must ensure the calculator uses Algebraic  Logic as opposed to Arithmetic Logic. Algebraic logic uses priorities in sequences of operation which we call BOMDAS (Brackets, Of, Multiplication, Division, Addition and Subtraction)  • Keys should be of a reasonable size and have a positive click action  • They must have a display of at least 8 digits and be large enough for two or three  children to see  • They should have a memory function Maths software  • The use of maths software in conjunction with the use of interactive whiteboard is  part of our strategy in the teaching of maths in each class. |
| **Organisational planning**  In accordance with the DES guidelines 2 hours 15 minutes is allocated to mathematics education in the infant classroom.  3 Hours is allocated to 1st- 6th class for mathematics education.  In accordance with the Numeracy and Literacy Strategy 0007/2012 an extra minutes a week is now allocated to the teaching of mathematics.  Discretionary time is used during the year to facilitate events such as Maths Week held in October each year and maths trails from time to time. |
| **Resources**  The current resources available to the children and staff for Mathematics Education are currently under review at Boolavogue N.S. As part of our Numeracy Strategy, the resources will be documented and any missing resources will be purchased in the coming months. The aim is to have appropriate amounts of resources for the teaching of hands on mathematics as mentioned in the approaches and methodologies section. For the current list, please see appendix to this policy.  The school has recently purchased the Brain Snax problem solving cards and ICT licence for the teaching of problem solving in the neon end of the school. |
| **Linkage and integration**  Every attempt will be made to link the various strands of the Mathematics curriculum and to integrate the other subject areas with Mathematics, where appropriate.  e.g. Maths and History – timelines, length and width of Titanic  Maths and Science – height and weight of various living things  Maths and Geography- mapping and scale |
| **Extracurricular activity**  Opportunities are provided for children to participate in and enjoy maths week in conjunction with the National Maths Week held in Ireland in October of each year. During this week, activities such as Problem of the Day, Calculator riddles, maths games, maths trails etc. are participated in. It has been agreed as part of the Numeracy Strategy that a problem will be sent home in the monthly newsletter, the Boolavogue Bulletin, each month for parents and children to enjoy. The solution will be available in the following months Boolavogue Bulletin. |
| **Code of ethics**  All teachers and coaches working in the school context will be expected to adhere to the school Child Protection Statement. They should always ensure that they treat children with integrity and respect and that the self-esteem of children is enhanced. Positive reinforcement and encouragement is an essential part of mathematics teaching. |
| **Health and Safety**  The children are required to use equipment such as trundle wheels, compasses, weighing apparatus etc. appropriately and carefully. Children must abide by the rules for outside mathematics activity such as trails. Should an accident occur in the Mathematics Education lesson we will follow the procedures outlined for accidents in our Health and Safety policy. |
| **Individual teachers’ planning and reporting**  Individual teachers will design a mathematics education plan specifically for their own class while at the same time ensuring that their class plans coordinate with and feed into the overall school plan, set out in the policy. This should ensure clear progression as children move from class to class.  Strands covered in Mathematics Education each month are recorded on the Cúntas Míosúil.  The Cúntas Míosúil will be very relevant in recording what has been covered and in reviewing and developing the school plan for the following years. |
| **Staff development**  The school will access the PCSP Mathematics Cuiditheoir through the Regional Curriculum Support Service to support the staff in certain strands if necessary.  Teachers will be notified of courses relating to Mathematics Education available in the area. Skills and expertise within the school are shared and developed through inputs at staff meetings and collegiate networking among teachers. |
| **Parental involvement**  Parents have a responsibility to support the schools policy for the teaching of mathematics. Information evenings will be held as the need arises for support for parents around new approaches to the teaching of mathematics so that they can be facilitated in supporting their children’s development in mathematics.  • 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  Teachers and parents are afforded the chance to discuss each child’s progress in Maths at P/T days. They can, discuss 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. |
| **Community links**  We are very much aware of the school’s role in the community and we are also conscious of the fact that the expertise of people in the community is an invaluable resource to any school. Guest speakers or evening events around the teaching of mathematics may be held from time to time. Guest speakers may be open to the public during events such as Maths Week. |
| **Evaluating the policy**  Means of assessing the outcomes of the plan may include;   * Teacher/parent/community feedback * Children’s feedback regarding activity levels, enjoyment and skill development * Results of standardised tests and appropriate analysis of these results * Inspectors’ suggestions/WSE recommendations   **The criteria for evaluating the success of this policy will be :**   * The development of skills and understanding in the area of mathematics * The provision of opportunities for achievement for each child * The level of teacher satisfaction in teaching a broad, balanced curriculum. * The level of positive attitude towards the teaching of mathematics exhibited by the children |
| **Ratification and communication**  This Mathematics Education policy was ratified by the Board of Management on \_\_\_\_\_\_\_\_\_\_\_\_\_ and parents can inspect the policy in the school office. |