BALLYORAN PRIMARY SCHOOL

Mathematics & Numeracy Policy

November 2014

Contents

CONTEXT:

The stated vision of the Department of Education for N Ireland (DENI) is 'To ensure that every learner fulfils his or her potential at each stage of his or her development.' (DENI 2010).

This has been enunciated in the overall aim of the N Ireland Curriculum (DE 2008), which says, 'The N Ireland Curriculum aims to empower young people to achieve their potential and to make informed and responsible decisions throughout their lives.'

The School Improvement policy document, 'Every School a Good School,' (DENI 2009) has outlined indicators of what will be recognised as effective performance under four headings:

- Child centred provision
- High quality teaching and learning
- Effective leadership
- A school connected to its local community.

The prominence of Literacy and Numeracy within the NI Curriculum, emphasised in *"Count, Read: Succeed- a Strategy to Improve Outcomes in Literacy and Numeracy"* (DE 2011) :

" Literacy and numeracy are at the very heart of the revised curriculum." (para.2.3)
"Developing literacy and numeracy therefore must be central elements of a school's delivery of the curriculum, and of the support and professional development for teachers in implementing the curriculum."
(para. 2.5)

The characteristics of the most effective practice in numeracy provision in NI primary schools, identified by ETI in *" Better Numeracy in Primary Schools" (ETI 2010)*

INTRODUCTION:

At Ballyoran Primary School we believe that numeracy skills are the key to future educational success and to ensuring that each child has the opportunity to develop as an individual, as a contributor to society and as a contributor to the economy and environment.

We have adopted the definition of Numeracy from *"Count, Read: Succeed"* (para. 1.10) :

"The ability to apply appropriate mathematical skills and knowledge in familiar and unfamiliar contexts and in a range of settings throughout life, including the workplace. It involves the development of:

a. An understanding of key mathematical concepts and their inter-connectedness
b. Appropriate reasoning and problem-solving
c. The proficient and appropriate use of methods and procedures (formal and informal, mental and written)
d. Active participation in the exploration of mathematical ideas and models

OBJECTIVES OF NUMERACY POLICY:

At Ballyoran Primary School we intend that, by the end of Key Stage 2 and at a level appropriate to their ability, children will be able to:

- Choose the appropriate materials, equipment and mathematics to use in a particular situation
- Use mathematical knowledge and concepts
- Work systematically and check their work
- Use mathematics to solve problems and make decisions
- Develop methods and strategies, including mental mathematics
- Explore ideas, make and test predictions and think creatively
- Identify and collect information
- Read, interpret, organise and present information in mathematical formats
- Use mathematical understanding and language to ask and answer questions, talk about and discuss ideas and explain ways of working
- Develop financial capability
- Use ICT to solve problems and present their work

From: Requirements for Using Mathematics, NI Primary Curriculum, p.6 (CCEA 2007)

STATUTORY REQUIREMENTS:

The detailed statutory content requirements are set out in the NI Curriculum (Primary) document (CCEA 2007) and together with the progression exemplified in the Levels of Progression in 'Using Mathematics' document (CCEA 2012), informs our Scheme of Work for Mathematics.

The NI Curriculum (Primary) document also sets out guiding principles, which we endorse and have agreed to include in our policy:

In the Foundation Stage (p.23), pupils should be given opportunities to:

- Acquire early mathematical concepts through practical activities that involve sorting, matching, comparing, classifying and making patterns and sequences in a variety of contexts.
- Play, explore and investigate, do and observe, talk and listen and ask and answer questions
- Engage in a wide variety of activities, children should understand mathematical language and then begin to use the language to talk about their work
- Develop their skills in mental mathematics during counting activities
- Participate in mathematical activities, including open-ended tasks, presented through contexts that have a real meaning for children and provide opportunities for them to investigate their ideas

In Key Stage One and Two (p.57–60), pupils should be given opportunities to:

- Develop mathematical ideas introduced to children in meaningful contexts
- Participate in activities which are balanced between tasks which develop knowledge, skills and understanding, and those which develop the ability to apply mathematical learning and solve problems
- Use their knowledge of mathematical language to talk about their work and explain their findings
- Develop their skills in mental mathematics, to estimate and approximate and to investigate and make predictions and decisions:
    - within mathematics
    - across the curriculum
    - in real-life situations

CHILD-CENTRED PROVISION:

The following ESaGS indicators will be reflected in our provision for Mathematics and Numeracy:

- Decisions on planning, resources, curriculum and pastoral care reflect at all times the needs and aspirations of the pupils within the school
- A clear commitment exists to promoting equality of opportunity, high quality learning, a concern for individual pupils and a respect for diversity
- A school culture of achievement, improvement and ambition exists with clear expectations that all pupils can and will achieve to the very best of their ability
- Effective interventions and support are in place to meet the additional education and other needs of pupils and to help them overcome barriers to learning
- There is a commitment to involve young people in discussions and decisions on school life that directly affect them and to listen to their views

Inclusion

We aim to provide for all children, so that they reach their full potential in Numeracy according to their individual abilities. We will identify which pupils or groups of pupils are under-achieving and those with special educational needs in order to take steps to improve their attainment. This is achieved using standardised data in conjunction with teacher judgement. Gifted children will be identified and suitable learning challenges provided.

- All pupils receive high quality, well supported teaching and learning. Teachers set high expectations and monitor actual or potential underachievement.
- Pupils are given in class support through differentiated work, individual or small group work supported by the teacher and/or classroom assistant.
- SMART targets are outlined, monitored and evaluated termly.
- Analysis of standardised data highlights differentials between PIM and CAT test and differential between PIE and PIM in conjunction with teacher judgement.
- Visual aids, practical activities and differentiated schemes are used
- Newcomers are supported by Mrs Fusco
- Classroom Assistant works with groups on a rotating basis
- Parents are informed, through Parent/Teacher meetings (2 per year) alongside Annual Report, of any difficulties that may arise, in conjunction with our 'open door' policy.

Differentiation

All classes are mixed ability classes. Each teacher therefore plans and organises his/her teaching to take account of the differing abilities within the class. Depending on the nature of the activity, there may be times when the whole class can be engaged in a similar activity, while at other times, the class will be divided into ability groups to ensure that each child is working at an appropriate level.

Intervention Programmes

Intensive Support

Underachieving (slightly below average ability) pupils are targeted for Numeracy intervention. Year 2 and Year3 pupils are given priority to ensure early intervention. Intensive Support is also offered to Year 4 and 5 pupils in the afternoon. Intervention is based on the Mathematics Recovery method which has been adapted to small groups. Maths Recovery aims to teach the basic skills of number by presenting the pupils with challenging practical tasks which are designed to be at the cutting edge of each child's ability. Activities are taught sequentially and use a wide variety of visual materials. Daily observations are recorded by the teacher. The maximum group size is four pupils. Individual pupils are given a series of Maths Recovery tests as a baseline. Groups are formed using these test results and teacher judgement. At the end of the teaching block (usually 10-12 weeks) individual testing is repeated and compared with baseline results. Recommendations for progress are made to staff and parents. One teacher is employed, for both Literacy and Numeracy intervention, for two full days per week (Tuesdays and Thursdays). One classroom assistant, who has been trained in Numeracy Catch-Up techniques, also takes small groups of pupils, when required.

Numeracy Catch-Up

This programme is offered to selected Year 4 pupils. It is funded by Neighbourhood Renewal. Pupils work in a small group (3-4 pupils) with a trained classroom assistant. They receive four 30 minute sessions after school for a block of approximately 8 weeks. The pupils are selected based on their Progress in Maths results at the end of Year 3. In order to be eligible, pupils must have a difference of more than 10 between their standardised PIM score and their CAT test (they are deemed to be underachieving). During Numeracy Catch-Up, the classroom assistant consolidates previous teaching in all areas of the Mathematics curriculum concentrating specifically on 'Processes' element one day per week. The classroom assistant works in conjunction with the class teacher and the Numeracy Co-ordinator. The pupils are then retested at the end of Year 4 to see if there has been an improvement in their standardised score. Parents are also encouraged to reinforce pupil learning through fun activities which are sent home to play.

Newcomer Support for all Pupils

Teachers are aware that Newcomer children may not have the same level of understanding of English as other children which obviously translate into other areas of learning. Newcomers who have not been identified as having Special Needs receive numeracy support from Mrs Fusco, Classroom Assistant. Mrs Fusco can go over mathematical terminology to assist their learning in the classroom. Mrs Fusco works closely with Miss McGibbon (Inclusion and Diversity Co-ordinator) who in turn has close links with the Inclusion and Diversity Service.

Equal Opportunities

All children are provided with equal access to the Numeracy curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

HIGH QUALITY TEACHING AND LEARNING:

The following ESaGS indicators will be reflected in our provision for Mathematics and Numeracy:

- A broad and relevant curriculum is provided for the pupils.
- An emphasis on literacy and numeracy exists across the curriculum.
- Teachers are committed and enthusiastic, enjoying a positive relationship with their pupils and with other school-based staff and dedicated to improving learning.
- Teachers use adaptable, flexible teaching strategies that respond to the diversity within the classroom.
- Assessment and other data is used to effectively inform teaching and learning across the school and in the classroom and to promote improvement.
- Rigorous self-evaluation is carried out by teachers and the whole school, using objective data and leading to sustained self-improvement.
- Teachers reflect on their own work and the outcomes of individual pupils.
- Education outcomes reflect positively on the school and compare well, when benchmarked measurement is undertaken, against the performance of similar schools.

Subject Organisation

The Numeracy Curriculum is delivered using the requirements in the N. Ireland Curriculum for Mathematics and Numeracy.

Pupils are taught in single year groups. Each class teacher organises the pupils into ability groupings, above average, average, below average. Classroom assistant, if applicable, is used to support pupils individually or in small groups, as directed by the teacher. The pace and challenge of the work is planned so that all pupils make appropriate progress and learn effectively.

Teachers use the school's Yearly Overview for teaching and learning to direct long, medium and short term planning.

Topics are revisited each term with progression in the content as per the Yearly Overview.
Teachers have high expectations for all pupils and share these with pupils and their parents.

Teachers strive to

- Ø build children's confidence and self esteem
- Ø develop children's independence
- Ø allow all children to experience regular success
- Ø make mathematics a relevant and satisfying part of their school experience

Teachers share Learning Outcomes and Success Criteria (Assessment for Learning) with pupils at the start of every lesson and evaluate progress during the plenary session.

The Numeracy Co-ordinator monitors planners to ensure there is a broad and balanced approach throughout the 5 areas of attainment. The Numeracy Co-ordinator carries out two Book Scoops per academic year and provides feedback to the teacher verbally and with a written report. Each Book Scoop entails three books from each ability group and the Co-ordinator matches books to planners for consistency, progression, AFL and differentiation.

Teachers use a variety of teaching strategies including whole-class teaching, co-operative small group work and individual work differentiated where appropriate. The varied approach recognises that different children learn in different ways. The choice of strategy will vary according to the age, ability, maturity and interest of the children. It will include teacher-led, practice and consolidation, practical, discussion, problem-

solving and investigative work. Pupils will be engaged in a wide range of purposeful activities.

Teachers will focus on the development of skills, knowledge and concepts required to maximaise learning strategies.

Each teacher monitors and evaluates their own teaching on an ongoing basis. This involves judging whether children are achieving intended learning outcomes and the information generated is used to gauge the effectiveness of the teaching approaches used and to inform planning for further teaching.

Use of age-appropriate practical materials, symbolic representation and application for developing mathematical concepts.

Effective use of digital technology to support learning.

Pupils are given opportunities to apply their mathematical knowledge and understanding across the curriculum and in real-life situations.

Pupils are encouraged to ask as well as answer mathematical questions.

Planning

Numeracy planning is carried out in three phases (long term, medium term and short term.

Long term planning includes the Yearly Overviews which give an 'at a glance' snapshot of the work to be carried out in each term from Year 1-7. The Yearly Overview was drawn up in conjunction with the Revised Lines of Development and SELB Numeracy Advisory Team. Mental Maths strategies to be covered by each year group are contained in the school's Core Competences.

The Medium Term planning is now in the shape of a Termly Topic Planner grid showing specifically what topic is being taught each week. Teachers complete this in the first week of each term. This also includes the Mental Maths strategy to be covered for that week taken from the school's Core Competences. Each Numeracy topic will be visited once per term to ensure continuity and progression within each class and between classes.

Short term planning is carried out on a monthly basis. The planners are broken up into weeks which include the maths topic to be covered, along with the mental maths strategy being focused on. These are detailed planners and include the learning intentions (taken from the Yearly Overview) and success criteria being covered. The planners include teaching strategies as well as the follow-up activities for each level. Differentiation is included on the planners as well as the use of ICT. Teachers also complete a separate Processes planner in a 4-6 week block. Each planner is based on one of the seven specific strategies to be taught eg reason logically, try a simpler case. Again differentiation and use of ICT is evident in the planner. These are updated on a yearly basis and stored on RM Staff.

Approaches to learning and teaching of Mental Mathematics:

- Teachers are encouraged to highlight the interconnections between developing a bank of known number facts, an increasing range of calculations and an increasing range of mental calculation strategies
- There is structured progression for mental mathematics within and across year groups based on the school's Core Competences
- Teachers ensure every Numeracy lesson starts with 10/15 minutes Mental Maths. Each teacher chooses a core competence from the school scheme and focuses on it for the duration of the week.
- 'GL Mental Maths' test is used to assess progress in mental mathematics. It is completed twice per year from Year 3-7 and the results analysed and compared with previous data by the relevant class teacher and the Numeracy Co-ordinator
- Teachers use a variety of activities, including games and ICT to develop calculation strategies
- Pupils are encouraged to verbalise their method/strategy using appropriate mathematical terminology to demonstrate understanding
- Pupils build up a good understanding of the Number system, based on Place Value of Base 10

Approaches to learning and teaching in Number:

The following are introduced at appropriate stages according to the school's Maths Scheme:

- Understanding the number system – counting, sequencing, place value, fractions, decimals, percentages
- Calculations – four operations and their relationships
- Strategies to encourage understanding of operations, not just ability to compute answers
- Application of calculation skills in mathematical problem solving, across the curriculum and in real- life situations, especially in selection of operation(s) required
- Application of financial capability skills

Approaches to learning and teaching in Measures:

- Progression: direct comparison of two objects, more than two objects, measuring using non-standard units, recognising need for standard units, measuring using standard units
- Strategies used to enable children to develop accuracy in estimation before measuring
- Use of practical activities
- Opportunities for children to select the appropriate measuring tools and units of measurement

Approaches to learning and teaching in Shape and Space:

- Importance of practical experiences to investigate properties of shapes
- Emphasis on naming shapes by reference to their particular properties
- Exploration of position and movement in real life contexts
- Systematic development of language from informal to formal mathematical definitions as per Maths Scheme
- Importance of experiencing irregular shapes as well as regular shapes

Approaches to learning and teaching in Handling Data:

- Emphasis placed on the application of data handling skills to investigate and make decisions: Identify a question, decide on information required, decide how to gather information, record and analyse information to answer original question, decide how best to display information
- Systematic development of understanding of probability: from informal language to describe likelihood of events occurring, through formal language of increasing accuracy to numerical quantification of likelihood.
- Use of ICT packages to speed up process of constructing graphs and charts

Approaches to learning and teaching in Processes:

- Agreed definition of Processes
- Progression of Processes skills developed within and across year groups – the seven process strategies have been timetabled across the school year. The teachers focus on each strategy for 4-6 weeks.
- 1 Processes lesson per week with a focus on a specific strategy being taught
- Opportunities for children to develop Processes skills e.g. through choosing materials and mathematics required, using a range of problem–solving strategies
- Opportunities for children to plan their own work and work systematically
- Use of open ended problems/questions to encourage children to explain their thinking
- Opportunities for children to work collaboratively and to compare ideas and methods with others
- Pupils will be asked to show an increasing level of independence in their planning and recording of work as they progress through the school
- Opportunities will be provided for children to search for patterns and use relationships in investigative work, leading to an appreciation of generalisations.
- Engage in a range of meaningful problem-solving and investigative activities in real-life situations.

Use of ICT

Throughout all areas of Mathematics, teachers will plan for and use digital technology to support, enhance and reinforce their teaching.

- Teachers use the Interactive Whiteboard and appropriate numeracy software eg Maths Pack 1,2,3.
- Pupils have access to laptops, I-pads and the ICT Suite to develop their numeracy skills.
- ICT is included in the numeracy planners
- Teachers will be updated and trained as appropriate in numeracy software
- In addition, pupils from Year 3-7 have all been registered to use the 'Alta Maths' package. This is a complete web-based formative assessment diagnostic tool. Children log-on on a regular basis and complete numeracy problems. Teachers can use Alta Maths to monitor individual pupil's progress or whole class progress.

Monitoring and evaluating Children's Work

Assessment is an integral part of the teaching and learning process. The purpose of assessment is three-fold:

1. To evaluate the children's progress and levels of attainment in Numeracy.
2. To evaluate the effectiveness of the teaching of Numeracy.
3. To enable the teachers to plan further work.

Teachers continually assess children's performance and progress, and the effectiveness of their teaching approaches and strategies. Teacher's planning is based upon the identification of Intended Learning Outcomes for the children; assessment is therefore based upon deciding whether or not those Learning Outcomes have been achieved. Pupils are assessed by their teachers on an on-going basis. The assessment also identifies and rewards achievement, as well as highlighting concerns. It varies according to the age and ability of the pupil. Information is gathered in a variety of ways:

- discussion between child and teacher
- observation whilst children are participating in activities
- marking written work produced by the children according to the Learning Intentions and Success Criteria for the lesson

Teachers mark class work and homework thoroughly and according to the Marking Policy. Teachers regularly move around the classroom, marking each child's work as they carry out a task or activity, so that problems can be detected early. In the Foundation Stage especially, the teacher will mark the work with the child and give feedback. This is essential so children know how they are performing in class.

Teachers ensure assessment activities are planned and embedded in learning and teaching. Assessment of pupil achievement in the Cross-Curricular Skills of Using Mathematics is in reference to the Levels of Progression. Teachers from all year groups meet every two months to discuss and level samples of work in all areas of Using Mathematics using these levels. This process is known as Internal Standardisation. Each teacher retains and updates a portfolio of levelled work for each child.

More formal methods are also used to determine the levels of achievement of children at various times during the school year:

- End-of-topic tests
- Mental Maths Core Competences
- Standardised Testing
    - Ø Progress in Mathematics – once per year from Year 3
    - Ø GL Mental Maths Test – twice per year from Year 3
    - Ø Middle Infant Screening Test – Year 2

These allow the school to measure each child's attainment in all areas of mathematics and compare this with an 'average' for children of that age. The results are used to monitor individual's progress year on year and identify pupils who may need extra support. The data is also used to identify whole school areas of weakness to be included on the School Development Plan.

- Statutory End of Key Stage Assessment – this is carried out at the end of Key Stage 1 and 2. Although levels are assessed for each attainment target, parents will normally be informed of one overall level for Mathematics, based on the level achieved in Processes in Mathematics attainment target. A level is assigned in each area of Mathematics. Assessment is carried out by the class teacher, but may be externally moderated by CCEA. The teacher uses a set of Assessment Tasks along with teacher judgement to arrive at a level for each child.

EFFECTIVE LEADERSHIP:

The following ESaGS indicators will be reflected in our provision for Mathematics and Numeracy:

- An effective school development plan is in place, providing clear and realistic targets for improvement based on a sound vision for the school.
- Governors understand their responsibilities and provide clear strategic direction as well as support and challenge to the Principal in carrying forward the process of improvement.
- School leaders demonstrate a commitment to providing professional development opportunities for staff, particularly teachers, and promote a readiness to share and learn from best practice.
- Teachers are given the opportunity to share in the leadership of the school.
- The resources at the disposal of the school are managed properly and effectively, with appropriate arrangements in place for financial management, attendance management, and working relationships.
- School leaders monitor and evaluate effectively school outcomes, policies, practices and procedures and the School Development Plan itself

Role of the Numeracy Co-ordinator:

The Numeracy Co-ordinator will be responsible, in consultation with the Principal, teachers and parents, for improving the standards of teaching and learning in Numeracy by:

- demonstrating expertise, enthusiasm and vision
- promoting self evaluation in order to enhance the monitoring, evaluation and review processes
- collaborating with the rest of the teaching staff to identify priorities for development within Numeracy
- Producing and discussing the Numeracy Action Plan with staff each year. This includes one major focus for the year which usually permeates all Key Stages.
- monitoring, evaluating and recording progress on the Numeracy Action Plan
- ensuring a regular review and update of the policy with all staff
- encouraging staff to use a range of learning and teaching strategies to best meet the needs of pupils
- assisting teachers to avail of Numeracy courses as available to enhance their understanding and teaching of Numeracy
- organising school-based INSET and School Development Days as required
- providing guidance in the effective use of comparative performance data, including benchmarking
- encouraging management to offer support for identification, dissemination and implementation of good practice in the learning and teaching of Numeracy
- undertaking on-going monitoring and evaluation at individual, class and whole school level
- reporting to Principal and Governors about the school's Numeracy development
- supporting staff within the school to address continuing underachievement
- monitoring and evaluating Numeracy
    - pupil progress - tracking pupils' progress and identifying those who may be underachieving and who may benefit from further support
    - management and analysis of relevant data - setting annual targets for improvement in a specific area of Numeracy (using analysis of PIM data throughout the school)
    - provision of Numeracy (including Intervention and Support programmes)
    - the quality of the learning environment - The Numeracy Co-ordinator carries out lesson observations as part of the PRSD process (when appropriate) and gives written and oral feedback to individual teachers.
    - the deployment and provision of support staff

The Board of Governors

Regular reports are made to the governors on the progress of Numeracy provision and on the standards being achieved by the school.

A SCHOOL CONNECTED TO ITS LOCAL COMMUNITY:

The following ESaGS indicators will be reflected in our provision for Mathematics and Numeracy:

- Good relationships that facilitate engagement and communication between the school and its parents and the wider community that it serves
- The school and its teachers are held in respect by parents and the local community who in turn actively support the work of the school
- The school uses its involvement in particular programmes (e.g. Extended Schools) effectively in meeting the needs of the community and nearby schools
- Good relationships and clear lines of communication are in place between the schools and the education agencies that support it
- The school works closely with other relevant statutory and voluntary agencies whose work impacts on education, especially Health, Social Services and the Library Service and, where appropriate, local Neighbourhood Renewal groups

Links with parents:

- Reporting to parents: Parents information meetings, verbal and written reports on children's progress (including feedback from statutory assessment meetings), feedback via comments in children's books
- Helping parents support their children's learning: applying mathematics learning at home and in the real world, effective strategies to support learning through homework (including mathematics games)
- Use of school website to showcase high quality mathematics learning and teaching
- Numeracy based homework – which relates to work being currently covered in class. It should allow the pupils opportunity to practice and improve skills introduced in class
- Numeracy Intensive Support programme for selected pupils in Years 2-4
- Numeracy Catch-Up for selected Year 4 pupils
- School website/Class Pages eg tips for parents to support their children's learning
- Participation in educational Maths Shows

Links with other schools:

- Clusters for staff development
- Visits to other primary schools to share and compare effective practice,
- Meetings with post primary schools to ensure cross phase consistency and to manage transition for children

Links with the Community:

- Neighbourhood Renewal projects
- Extended Schools projects – Numeracy Catch-Up
- Visits to local businesses/from local tradespeople, where mathematics is used in their work e.g. shops, builders, kitchen and furniture suppliers and fitters, tilers, farmers
- Visit from bank in relation to Maths Mathemagic Show (Cahoots NI sponsored by Northern Bank)

Links with external education support agencies:

- Staff development sessions from Educational Psychology Service, SELB Special Needs service

CONSISTENCY WITH OTHER SCHOOL POLICIES

The content of the Numeracy Policy is checked to ensure consistency with other school policies including:

- Learning and Teaching Policy
- Assessment and Record Keeping Policy
- Marking Policy
- Homework Policy
- Special Educational Needs
- ICT Policy
- Equal Opportunities Policy
- Health and Safety Policy

MONITORING and EVALUATION of POLICY

The Numeracy Policy is:

- Agreed with the Board of Governors
- Shared with parents
- Available to the general public via the school website
- Regularly reviewed and updated in consultation with school stakeholders: staff, children, parents and governors

REVIEW OF POLICY:

This policy will be reviewed and monitored when deemed necessary.