

# **St Nicholas' Primary**



**Numeracy and Maths Policy**  
**( Oct 2020)**

## **Our vision, values and aims**

Teachers across Scotland are working tirelessly to achieve excellence and equity in education for all our learners. Our vision is to support the Scottish Government's priorities, set out in both a Curriculum for Excellence and the National Improvement Framework, and provide a first class education in numeracy and mathematics. Through the provision of high quality learning experiences, our learners will develop all the numerical and mathematical skills needed, to function responsibly in everyday life and equip themselves for the world of work and lifelong learning.

'To face the challenges of the 21st century, each young person needs to have confidence in using mathematical skills, and Scotland needs both specialist mathematicians and a highly numerate population.' Building the Curriculum 1. Historically, mathematics has been viewed as an elitist subject, only for the most academic learner and has not been viewed as a valuable skill attainable by all. Our vision is to foster links between our communities, helping us to work more effectively together. Together we will work to transform attitudes to maths, dispel the myth that 'not everyone is a maths person', leading to raised levels of attainment and achievement across learning. A child's education starts from birth, not from when they start school. Learning takes place everywhere, at all times, and not just during the school day. Our vision is for our community to learn together and from each other. Together we can build the drive and determination to succeed, never giving up, learning and growing from our mistakes.

We aim to set the context for raising attainment, achievement and equity for all through:

- developing a positive attitude to numeracy across our whole school community, fostering high aspirations and an ethos of achievement
- ensuring all our learners have access to meaningful learning experiences which enable skills progression, taking full advantage of digital technologies
- ensuring all our learners develop a deep and secure conceptual understanding of numeracy
- enabling all our learners to demonstrate confidence in analysing information, solving problems and making informed choices
- supporting all our learners to demonstrate understanding of their progress by providing them with appropriate feedback, and personal target setting at all stages
- building staff capacity and developing knowledge, skills and abilities across all sectors through high quality professional development and networking events
- encouraging active involvement of families to support learning at home
- ensuring continuity and progression in learning through effective transitions at each stage.

## **Rationale**

Being numerate involves developing an ability and confidence in using numbers that allows us to function responsibly and contribute effectively to society. Good numeracy skills are necessary for successful learning and are essential for life and work beyond school.

Each of the four contexts for learning provide a range of opportunities for the development of key numeracy skills. Making explicit links across learning will both enrich our learner’s experiences, and deepen their knowledge and understanding. Problem solving using real-life contexts, is known to improve levels of engagement and increased motivation to learn. At St Nicholas’ Primary we endeavour to create a numeracy-rich curriculum where numeracy across learning is the responsibility of all staff.

Below is an example of links across the curriculum:

<b>Social Studies</b>	<b>Sciences</b>	<b>Physical Education</b>	<b>Music</b>	<b>Art, Design and Technology</b>
percentages	speed	speed	speed	2D shape
probability	distance	distance	time	3D objects
time	time	time	fractions	proportion
data handling	algebra	data handling	length	tiling
scale	data handling	scale		ratio
coordinates	length	coordinates		scale
ratio	weight	length		length
length	volume	weight		weight
				volume

Numeracy and maths skills are intertwined and both are important in our everyday lives. They allow us to make sense of the world around us and to manage our lives. Using mathematics enables us to model real-life situations and make connections and informed predictions. It equips us with the skills we need to interpret and analyse information, simplify and solve problems, assess risk and make informed decisions.

Eight key numeracy and mathematical skills are embedded in the experiences and outcomes of A Curriculum for Excellence and cannot be taught in isolation. The ability to:

- interpret questions,
- select and communicate processes and solutions,
- justify choice of strategy used,
- link mathematical concepts,
- use mathematical vocabulary and notation,
- use mental agility,
- reason algebraically, and
- determine the reasonableness of a solution

## **Planning, Assessing and Moderating Progress in Numeracy and Mathematics**

Our curricular framework for Numeracy and Maths provides progressive skills approach that can be used to develop high quality, effective learning and teaching activities, questions and a range of assessments. These should encourage learners to think about the concepts, going beyond the recall of knowledge and encouraging them to explain their thinking. As learners progress through Curriculum for Excellence levels, they should demonstrate increasing sophistication and independence in their ability to demonstrate, link, transfer and apply the following skills in a range of increasingly more challenging contexts.

### **Planning**

- A consistent approach to planning for progression in Numeracy and Mathematics is essential and staff are encouraged to plan collaborative with colleagues i.e. stage partner.
- Planning should include the integration of mental maths strategies to promote the development of flexible thinking and consolidate and extend learning.
- All learners should be actively involved in the planning of their learning. Staff should discuss with learners what they are expected to learn. They should clarify and share learning intentions and success criteria, built from experiences and outcomes, providing appropriate experiences for achieving these through the four contexts of differentiation.
- High quality and moderated planning, learning, teaching and assessment should meet the needs of all learners, providing appropriate pace, challenge and support.
- Formative assessment should underpin the learning and teaching of Numeracy and Mathematics to facilitate a rich and meaningful dialogue about progress in learning between staff and learners. Supporting learners with regular target setting and detailed feedback promotes engagement, a mathematical growth mindset and ensures that children and young people are leaders of their own learning.

### **Assessment and Moderation**

Assessment of progress in Numeracy and Mathematics will focus on judgements about the success of children and young people in developing key numerical and mathematical skills and their ability to apply their skills in their learning, in their daily lives and in preparing for the world of work.

Robust tracking and monitoring is in place to support all our learners' progress and achievement. Numeracy and Mathematics is moderated regularly at stage, level and cluster in order to share standards and continue to raise expectations. Evidence of progress in numeracy should be gathered as part of day-to-day learning as well as across the curriculum. The benchmarks are used to help monitor progress towards achievement of a level and to support overall professional judgement of when a learner has achieved a curriculum level. They support professional dialogue, moderation and monitoring of progress and learning, to ensure consistency of approach in sharing standards.

Evidence of progress and achievement includes:

- observing day-to-day learning within and out with the classroom
- course work including summative and formative assessment
- learning conversations

- planned periodic holistic assessments
- information from standardised assessments

The roles and responsibilities of all practitioners in the assessment of numeracy are that:

- any assessment approaches should identify the extent to which learners can apply their skills in and beyond the classroom, and across learning
- feedback should develop metacognition in learners leading them to recognise their next steps and how to take them
- feedback should be in the moment
- praise achievement and not ability
- involve learners in their learning through the planning of learning goals and by leading learning
- attainment in numeracy robustly tracked and used to provide effective and timely interventions to support and challenge learners

A wide range of evidence should be collected and used when making judgments about learners' progress and there should be evidence of breadth, challenge and application. Dialogue about progress in learning should underpin assessment and moderation activities, particularly at key points of transition. Learners should lead this dialogue about their own learning.

Our quality assurance procedures are used to generate targets for improvement at class and whole school level. SMT work alongside teachers to ensure that tracking systems contain valid and reliable recordings. Pupil progress in numeracy and mathematics at key points in transition is closely analysed, both across year group settings and Curriculum for Excellence milestones at P1, P4 & 7. Clear evidence of progression through is evidence within our assessment folders and supported by national standardised assessments.

When scrutinised, data from our robust quality assurance procedures should clearly illustrate the impact of intervention approaches and the 'added value' of teaching and learning as learners progress through levels. This takes into account variation in SIMD levels across the learning community and any support put in place to address and minimise any poverty-related attainment gaps. Collaboration across sectors is a key feature of success.

### **Excellent learning and teaching**

'From the early stages onwards, children and young people should experience success in mathematics and develop the confidence to take risks, ask questions and explore alternative solutions without fear of being wrong.'

'Mathematics is at its most powerful when the knowledge and understanding that have been developed are used to solve problems. Problem solving will be at the heart of all our learning and teaching'.

CfE Mathematics: Principles and Practice

Evidence shows that there are significant differences in children's numerical and mathematical knowledge when they begin school (Aubrey, 1993; Wright, 1991a; 1994; Young-Loveridge, 1989; 1991) and these studies also show that these differences increase as they progress through school.

We need to carefully take account of differences in ability in our P1 learners, making steps to close this attainment gap. This can be achieved through careful planning and teaching using SEAL strategies and approaches, play pedagogy, the use of concrete materials, targeted support, as well as playing and learning with others.

St Nicholas' P. S are committed to supporting teachers in developing and embedding the Play2Learn approach of teacher-directed, teacher-initiated and child-led learning. Children experiencing play-based learning are given more opportunities to act independently, creatively, and are engaged in more challenging activities. Play pedagogy is important in the development of a child physically, socially, emotionally and cognitively. Taking into account pupil enquiry based learning approaches, current research and national guidelines, we recommend the following generalised structure to teacher-directed numeracy and maths:

In St Nicholas' P. S, across all levels of the curriculum, excellent and effective learning and teaching in Numeracy and Mathematics will involve a skilful mix of approaches and resources as part of a progressive skills planner. The delivery of these approaches should include:

- within early level, a balance of spontaneous approaches to play working alongside carefully structured adult-initiated activities
- harnessing the motivational benefits of responsive planning and helping learners lead their own learning
- planned active learning which provides opportunities to observe, explore, investigate, experiment, play, discuss and reflect
- the use of a variety of effective resources which challenge and stimulate enquiring learners
- experiences with concrete materials to help make thinking visible and support understanding
- natural progression from concrete to pictorial and symbolic representations
- a range of differentiation strategies and flexible learner groupings
- contextualised and differentiated core activity, providing suitable support and challenge
- embedded Assessment is for Learning strategies so that young people understand the purpose and relevance of what they are learning and can plan their next steps
- collaborative working as well as independent thinking and learning to encourage logical and creative reasoning
- the use of relevant, real-life and interesting contexts to engage and motivate
- developing problem-solving and higher order thinking skills
- the use of mistakes and misconceptions to deepen understanding of key concepts, encouraging growth mindset

- making meaningful links for learners across different curriculum areas
- involving learners and parents/carers in discussing learning pathways and next steps
- making appropriate and effective use of digital technologies to enhance learning and teaching
- assess and build on learner's prior knowledge
- specific, accurate and clear feedback, providing next steps to groups as required
- plenary to review learning and plan next steps

The effective use of problem solving starter activities and open questioning, helps teachers to assess the depth of prior learning and the presence of any misconceptions. Explicitly highlighting misconceptions in learning and dealing with them head-on stops any misunderstandings becoming deep rooted. This can be a useful tool to introduce a new topic or to reinforce and recap on prior learning.

Staff in St Nicholas' P. S carefully make use of flexible groupings which is a key aspect to raising attainment for all, ensuring that we address and minimise gaps in attainment. Groups are carefully selected to create a workable range of abilities, and concrete resources should be made available to scaffold and support learner's understanding of key concepts. Concrete resources should be temporary and learners will naturally move onto more pictorial and procedural methods once understanding is achieved. Working together and discussing different strategies and approaches to problem solving will help and benefit all learners.

From the starter activity, children should be able to identify the key learning intention and co-construct success criteria. Contextualised and differentiated core tasks will help motivate learners, helping them to make links across different aspects of the curriculum. It is important that they understand the skill they are learning, why they are learning it, and its benefits and uses to learning, life and work. The use of peer assessment enables children to give each other valuable feedback so they learn from and support each other. This will eventually lead them to be able to self-assess and regulate their own learning and set personal targets. The use of open ended activities allows learners to demonstrate their own personal level of understanding, skills and abilities.

Teachers have a clear understanding of the progression of skills through the levels of A Curriculum for Excellence, to identify the appropriate standards of achievement for their class. Learners are also encouraged to understand their learning journey, and the required steps and support needed for them to move to the next part of their journey.

### **Maths Champion**

Within East Dunbartonshire Council, all primary schools are encouraged to nominate a Maths Champion, in St Nicholas P. S this is *Mrs Lorna Orr*. The role of the Maths champion in St Nicholas' P.S is to support colleagues in effective learning, teaching and assessment in Numeracy and maths. Throughout the session, the Maths Champion attends training that can support school improvement and professional learning within the school. At times, the Maths Champion can help assess, identify gaps in learning and then plan a programme of learning with staff in order to meet the needs of a specific learner.

It is essential that an interconnected approach is used across the school to ensure a seamless focus for support. This should include the Maths Champion (working within an advisory and coaching role) to support class teachers alongside support for learning staff to identify and deliver a focussed programme using Maths Recovery strategies and approaches. In addition to coaching support from Maths Champions, Support for Learning coordinators should work alongside staff to ensure they are well supported to provide appropriate learning experiences for children. Classroom assistants and support staff are key members of the school team and work alongside teachers to support learning and promote a passion for numeracy and mathematics. They are provided with professional learning on numeracy and mathematics which enables support staff to be aware of effective teaching strategies and approaches, and engage with the mathematical language being developed at each stage. As a result, our support staff will be more effective in challenging and supporting learners using approaches that mirror those of the class teacher.

Our recent professional learning programme ensures staff have an understanding of how learners acquire numerical and mathematical skills and concepts. We promote the use of SEAL, Maths Recovery and CPA (concrete-pictorial-abstract) strategies in approaches to everyday teaching and learning.

### **Parental and Partner Engagement**

Numeracy, as responsibility for all, includes parents/carers and the wider community. To ensure our learners get the best start in life, are well-supported in their learning and achieve their full potential, we strive to develop positive relationships with parents and partners. This relationship will provide opportunities to share the positive message about numeracy and mathematics, raise expectations, and build capacity in families and communities to support children and young people.

Our home learning promotes active learner engagement and provide opportunities for parents and children to talk about learning in numeracy whilst identifying real life connections. Numeracy home learning tasks are mainly through sumdog and /or study ladder and enhance and complement work being completed in school.

We engage with our partners and parents to support learners in recognising the relevance of numeracy and mathematics as an important skill for learning, life and work. We take every opportunity to highlight the importance of the numeracy and mathematics curriculum through events and programmes involving families and the local community e.g. stay and play events, school open days, World of Work week, Financial Education Week, Read, Write and Count, Maths Week Scotland etc.

As a school we continue to make use of East Dunbartonshire's Parental Engagement Strategy (2018) to further develop our approaches to family learning and parental engagement to ensure that parents feel well supported and have the necessary skills to help their children to learn and enjoy mathematics.



## **Resources and Strategies**

At St Nicholas' Primary School, the teaching, learning and assessment of Numeracy and Mathematics is not resource led. As such, our teachers do not follow schemes of work in textbooks. We work together to look carefully at the CfE Experiences and Outcomes and Benchmarks and decide how they can be achieved using a variety of teaching styles, questioning and resources. Below are some of the many resources and strategies that teachers employ to provide exciting and engaging learning experiences for our learners.

### **Stages of Early Arithmetical Learning (SEAL) and Maths Recovery**

Key to its success, SEAL provides a clear framework which makes it easier to pin-point a child's numerical knowledge. By providing clear guidance in the teaching approaches and the key topics involved in early number SEAL gives significant depth to learning various strategies to embed number skills. This framework is used as a teaching guide in Early and First Level classes, alongside Heinemann and Teejay resources and activities. SEAL resources can be found in trays on the lower floor open area.

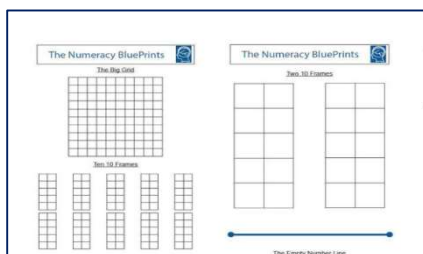
Maths Recovery, which uses the SEAL framework to assess children who may have gaps in their mathematical learning, is used throughout the school to support individuals and groups of learners.

### **Number Talks**

Number Talks are short, daily exercises aimed at building number sense and encouraging children to use different strategies to solve problems. They develop children's ability to play with numbers meaning they can visualise problem solving, perform calculations quickly, and are flexible in their mathematical strategy.

### **Numeracy Blueprint Boards**

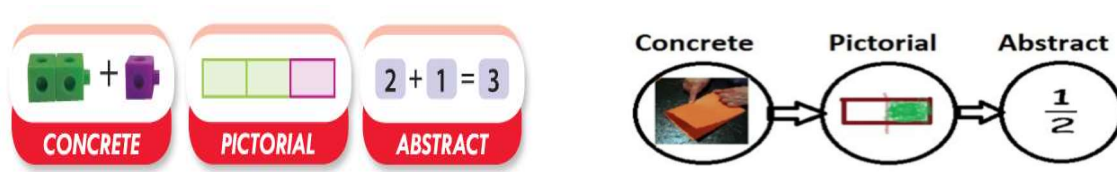
The Numeracy Blueprint Boards help develop a conceptual understanding of number and number processes. They are an excellent tool for deepening understanding and helping children take more responsibility for their own learning. They include a 100 square, ten 10 frames, and empty number line, two 10 frames, a vertical number line and white space for demonstrating thinking skills. Each class has a large teaching 'Count on Us Board' and a class set of individual boards. A useful guide on how to use these in the classroom can be found in the Staff Shared area.



### **Concrete Materials and Class Base Resources**

*Manipulative materials are objects designed to represent explicitly and concretely mathematical ideas that are abstract. They have both visual and tactile appeal and can be manipulated by learners through hands-on experiences. (Moyer, 2001)*

All areas of maths can be taught using concrete materials. Using concrete materials (e.g. cubes) allows children to progress to seeing representations of numbers (e.g. pictures of cubes) and eventually on to an abstract idea (e.g. using numbers only). The concept is illustrated here:



Primary 1-3 classrooms should have concrete materials such as cubes, counters and dice stored in class. These should be used regularly to introduce and reinforce concepts. Teachers in Primary 4-7 can access similar resources in the Upstairs Tutorial Rooms.

### **ICT to Enhance Learning**

As a school, we are fortunate to have a minimum of 5 I-Pads per class, which are used weekly by classes to enhance various areas of the curriculum. Many children benefit from playing maths based games on the I-Pads, laptop computers and interactive whiteboards which help them to increase their speed and fluency with number facts.

Pupils have also been introduced to coding as part of the Technologies curriculum. When children learn to code, they develop key skills like problem solving and practice algorithmic and computational thinking. These broad skill sets and ways of breaking down and analysing problems translate across the curriculum and are particularly helpful when it comes to numeracy and mathematics.

The staff shared drive also includes a variety of resources and games such as the EDC Interactive Resources and problem solving materials. To access these, click Start and click Primary Games, Teaching Money, Tables or Time, Heinemann or Nelson Thornes.

### **Textbooks**

TeeJay Maths and Scottish Heinemann Maths are the main textbook based resource that we use at St Nicholas' Primary School. We also have a selection of textbooks that we can use to support and extend our children e.g. Activ Maths, Connections and Spotlight.

### **Roles and responsibilities**

Teachers are responsible for the planning and implementation of Numeracy and Maths based activities with the pupils that they teach. Classroom assistants and Support for learning assistants are used to support and challenge individuals as directed by the class teachers.

The HT and DHT are available for advice and consultation.

### **Monitoring**

The HT and DHT will monitor learning and teaching in Numeracy and Maths. This is achieved through learning and teaching meetings, tracking meetings, monitoring children's work in jotters and on displays, class visits and pupil learning conversations. Teachers also take part in regular moderation activities to increase awareness of a shared standard across Numeracy.