**The Florence Nightingale Academy**

**Maths Policy**

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**Maths Coordinator – Mr Holland**

**Review Date – 2023**

**Rationale**

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary in most forms of employment. At The Florence Nightingale Academy, we believe in a high-quality mathematics education, therefore, it provides a foundation for understanding the world, the ability to reason mathematically and a sense of enjoyment and curiosity about the subject.

Mathematics is a proficiency which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an ability to solve number problems in a variety of ways in which information is gathered by counting and measuring and is presented in graphs, diagrams, charts and tables.

Mathematics gives children a way of coming to terms with their environment. Practical tasks and real life problems can be approached from a mathematical point of view. Mathematics provides children with imaginative areas of exploration and study and gives them the materials upon which to exercise their mathematical skills. These skills are a necessary tool of everyday life. Mathematics should help children to develop an appreciation of, and enjoyment in, the subject itself; as well as a realisation of its role in other curriculum areas.

**Aims**

At The Florence Nightingale Academy, we aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. The National Curriculum for mathematics aims to ensure that all pupils:

• become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

• reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

• can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

**Curriculum**

**Early Years**

The programme of study for the Foundation stage is set out in the EYFS Framework 2012. Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shape, spaces and measures.

**Key Stage 1 and 2**

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

**Key Stage 1**

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools). At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

 The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

 The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Cross curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Within every Science topic, children will also develop their mathematical skills. This will help children appreciate how to Work Scientifically but also practise discrete mathematical skills. Nevertheless, the prime focus should be on ensuring mathematical progress delivered discretely or otherwise.

**Maths at The Florence Nightingale Academy**

**Teaching and Learning**

The school uses a variety of teaching and learning styles in Maths lessons. Our pedagogy is based on research conducted by Rosenshine and his principles of instruction (2012).

Maths Delivery Document

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| **Intent** | We use the White Rose Schemes of Learning following the National Curriculum statements and provide any enhanced version of this. We use the progression model that outlines the knowledge, skills and vocabulary needed at each stage that will build to clearly defined end points.Teachers use the progression grid and topic schemes of learning to plan for their year group.Teachers then plan at a more detailed level the sequencing of content to be taught across each unit. |
| **Implementation** | Ensure that the teachers of the subject have excellent subject knowledge, and leadership supports that acquisition of this for NQT and non- specialist teachers.Subject matter is presented clearly, teachers carefully check learning and identify misconceptions, providing direct feedback.Teaching is designed to ensure children know more and remember more. Mathematics is carefully resourced to ensure we have all the specialism and resources required.  |
| **Impact** | Learners develop detailed knowledge and skills. We check this through regular pupil voice and collecting evidence of outcomes which we measure against our age base progression grids. Pupils are well prepared at each stage to be ready for the next stage of learning. KS1 and KS2 have end of Key stage assessments. |

How do ensure that knowledge gained is transferred to working memory into long term memory?

All staff use Rosenshine’s principals in action when planning and delivering lessons.



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| Strategies identified  | What do we expect to see in our Maths lessons? |
| Regular review | Academic or subject vocabulary that has been taught will be modelled throughout teaching. Teachers will revisit prior knowledge (previous year group/lesson). |
| Present new materials using small steps | Maths planning ensures achievable and repeated steps are provided to build children’s confidence, competence and retention, through the use of fluency, reasoning and problem solving. |
| Ask questions (Blooms taxonomy) | Questions help children practice new information and connect new material to their prior learning, so building on previous year’s learning. The teacher will question children around the specific knowledge and vocabulary they have using in this topic as well as others.  |
| Provide models | Expert teachers /peer models identified in the lesson will exemplify the specific skills/knowledge required for the task. |
| Guide student practice | Teachers will spend more time guiding children’s practice of new material. It will be forgotten unless time is given for rehearsal we revisit tasks over and over again, allowing children lots of time to practice. This is always guided and supported by expert teaching. |
| Check for children’s understanding  | Checking understanding at each point can help children learn the material with few errors. We would expect to see tasks/skills broken down into very small chunks, with regular assessment on their fluency, reasoning and problem solving.  |
| Obtain a high success rate | In Mathematics, we would expect to see that a skill is successfully taught before moving on. We take our time to achieve consistent success.  |
| Provide scaffolds for difficult tasks | The teacher provides children with temporary supports and scaffolds to assist them when they learn difficult tasks. |
| Independent practice | Children should have the opportunity to practice regularly and independently to transfer the knowledge into their long-term memory. In Maths lessons there is opportunity for this. |
| Weekly and monthly review | Children need to be involved in extensive practice in order to develop well connected and automatic knowledge. Daily flashbacks and reviews take place in Maths lessons, where teachers return to knowledge learned in a previous unit, and following a period of forgetfulness the children use that knowledge again. |

This is supported by the six effective learning strategies (Weinstein and Sumeracki 2019) to ensure that all of our children at The Florence Nightingale Academy become successful, independent learners who are actively engaged in their own learning.



Our principal aim through this pedagogy is to develop the children’s fluency, reasoning and problem solving in Maths.

We believe in whole-class teaching methods and combine these with enquiry and investigative problem solving activities.

We recognise the fact that we have children of differing ability in all our classes, and so we provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child using our differentiated star challenges. We achieve this through a range of strategies which are differentiated by task, expected outcome and/or support from peers or adults.

Based on combining pedagogy taken from Rosenshine’s principles of instruction and various metacognition strategies Mathematic lessons should follow the following structure:

**Our approach**

At The Florence Nightingale Academy we ensure that the teaching of Maths is based upon these key principals:

\*Review of prior knowledge – flashbacks of skills – these can be within the topic or recapping previous units covered.

\* Introduce new knowledge and skill for this lesson in small steps taken from the White Rose Schemes of learning. \* Fluency.

 - Introduce skill – through a range of Concrete, pictorial and Abstract concept of the White Rose Scheme.

 -Model using this skill and applying the knowledge (Your thought processes also)

 -Asking questions whilst modelling and lots of discussion.

\* Children practise mathematical fluency and apply lesson skill

 **-** Guided practice first (Class modelling and lots of discussion)

 - Children apply skill independently (Scaffolding may be required so all children can successfully apply learning)

 -Use of AFL and questioning to check student understanding.

\* Children will then use the skill to complete reasoning activities. \*\* Reasoning.

 **-**Guided practice first (Class modelling and lots of discussion)

\* Children will then solve problems \*\*\* showing their mastery in the knowledge learnt, so ensuring an engaging and challenging approach to deepen thinking and learning. They will either describe/ explain/ convince/ argue or prove their solutions are correct.

\* Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

\* As Arithmetic and written number knowledge (especially knowledge of times tables) are crucial to mastery of Maths and progression, Arithmetic will be practised daily at the start of each Maths lesson. See Arithmetic policy.

\* Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.

\* Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.

\* Pupils’ difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day by the third teacher.

**The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – ‘mastery’ – in mathematics, rather than many failing to develop the maths skills they need for the future.**

Maths Planning

At The Florence Nightingale Academy, our curriculum follows the mastery approach of White Rose. The concrete, pictorial and abstract representations suit the learning of The Florence Nightingale Academy children, so enabling then to deepen their understanding of Mathematics.

Assessment and recording

At The Florence Nightingale Academy, assessment is an integral part of the teaching process. Assessment is used to inform planning and to facilitate differentiation. The assessment of children’s work is on-going to ensure that understanding is being achieved and that progress is being made. Feedback is given to the children as soon as possible, and marking work will be guided by the school’s Marking Policy. The knowledge statements are ticked off in individual children’s books accordingly when a child has met the learning objective and this data is collated by class teachers.

Star test are taken in Maths in years 2 – 6, every term. This data is used by the teacher alongside teacher assessment to inform levels.

**Monitoring**

Monitoring takes place regularly through sampling children’s work, and teacher planning, through book looks, pupil voice and lesson observations.

**Roles and Responsibilities**

The subject is led by the staff as a whole and each year time is set aside to review standards and monitor curriculum provision and ensure training and resources are up to date.

**Resources**

We have a wide range of resources throughout school. Every class have basic resources needed for lessons to support the concrete method we follow. EYFS, KS1 and KS2 have differentiated resources according to need. There are topic resources centrally stored.