

Mathematics at Winterton Primary School and Nursery

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 for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum, 2014)

Primary mathematics education equips pupils with an imperative and unique set of tools to understand and rationalise. In addition to mental arithmetic and calculation skills, these tools include the ability to apply logic and reasoning, problem solve and to think in abstract ways. The skills and knowledge of mathematics are those which pupils will need to use throughout their lives; they are integral to all aspects of life and through our teaching of mathematics we endeavour to foster a positive and enthusiastic attitude towards mathematics within our pupils.

The responsibility of mathematics education is to enable all pupils to develop conceptual understanding of the mathematics they learn, its structures and relationships, and fluent recall of mathematical knowledge and skills to equip them to solve familiar problems as well as tackling creatively the more complex and unfamiliar ones that lie ahead. (Ofsted, 2012)

Aims

We provide our pupils with a mathematics education which allows them to thrive as resilient, confident and independent learners who are enthusiastic and engaged; through quality-first teaching, we aim to cultivate an environment which provides pupils with the tools to gain a positive mindset when faced with challenge, an environment where a love of learning extends to the often complex, creative, intriguing and rewarding subject of mathematics. Our aim is for our pupils to become confident learners who use a range of methods for solving problems and can apply mathematical skill to functional, real-life problems and use verbal reasoning to discuss and debate. Our mathematics teaching provides our pupils with the fundamental building blocks and allows them to use these puzzle pieces to consider, hypothesize and, with support, make connections across themes. We believe that those children who learn to explain why something makes sense and can apply reasoning through their mathematical explanations will not only develop a clearer and deeper knowledge, resulting in longer term understanding, but they will also develop a positive attitude towards the subject of mathematics and see the value of their studies.

Our mathematics curriculum is designed to ensure that all children:

- *become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.*
- ***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.* (NC, 2014)

We aim for all children to:

- develop a confident and enthusiastic attitude towards mathematics that will promote positivity and enable the use of fundamental, mathematical skill throughout their lives.
- understand mathematical methods on a conceptual basis rather than as a memorised procedure of steps without meaning.
- use mathematical vocabulary correctly to communicate ideas.
- demonstrate understanding and logical reasoning verbally through the use of clear conjecture and accurate mathematical terminology.
- make connections and progression within maths through a concrete-abstract-pictorial approach.
- progress onto the next stage of learning when they are ready and not beforehand to ensure clear and secure understanding of mathematical concepts.
- be given opportunities throughout the curriculum to apply their knowledge of calculations and mathematics.
- use their knowledge flexibly and creatively to apply understanding to unfamiliar problems.

Curriculum Content

EYFS

The teaching and learning of mathematics in EYFS are focused on providing opportunities for pupils to develop their skills practically. Planning, resources and free flow activities are designed to promote discovery, curiosity and independent learning whilst developing skills in counting, simple addition and subtraction, concept of shape, space and measure. Children work towards their Early Learning Goals of *Shape, Space and Measure*, where children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems, recognise, create and describe patterns and explore characteristics of everyday objects and shapes and use mathematical language to describe them and *Numbers*, where children count reliably with numbers from one to 20, order numbers, find one more or one less using quantities and objects, add and subtract two single-digit numbers, count on or back and solve problems, including doubling, halving and sharing. Pupils will experience the four operations through practical resources, collecting and sharing without even realising it. Counting activities and hands-on arranging and rearranging of groups will begin to give children visual representations of the four operations and at this point children will hear and be encouraged to begin using correct mathematical terminology and vocabulary associated. At this point, children will begin to record their results informally using mark making, diagrams and beginning to use digits.

KS1 and KS2 classes

In our Key Stage 1 and Key Stage 2 classes, the teaching of mathematics is based on the guidance from the National Curriculum (2014). Our planning is designed and tailored for the need in our mixed-age classes; this enables children to continue to develop their mathematical understanding at the level they require whilst also having access to teaching for their appropriate age group. Mathematics education at Winterton is centered upon the importance of understanding how and why - as opposed to learning mechanical processes - with an aim for the children to have secure knowledge of mathematical concepts before they progress towards the three mastery aims of problem solving, reasoning and fluency. For children to secure a deep knowledge of mathematical concepts, it is fundamental that they progress through the three necessary steps: concrete, pictorial and abstract learning. In our lessons we actively promote a C-P-A approach to teaching and learning and we ensure that children progress through these stages at their own pace. Additionally, we understand that research shows that each time a new concept is introduced to pupils it is necessary to return to concrete explorations. Mathematical dialogue is promoted and modelled by adults; children are encouraged to talk through their workings, to ask questions, to prove their answers and support their conjectures with reasoning.

Assessment

Assessment is an integral part of our teaching and learning: regular assessment through marking is imperative for informing the day to day and long-term planning for our classes. Additionally, through discussion and plenaries we are able to assess and identify misconceptions or topics which require revisiting. Furthermore, we also use termly, formal assessments and track pupils progress across the academic year using Pupil Asset.