



"Developing potential without limitations"

Frieth C.E.C. School

Mathematics Policy

Date Revised: April 2020

Member of staff responsible: Jo Reid

Governing body committee responsible: Curriculum

Headteacher's signature

Chair of Governor's signature

Review date: signed: date:

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Frieth C.E.C. School

Mathematics Policy

"Pure mathematicians just love to try unsolved problems – They love a challenge"

Sir Andrew Wiles KBE FRS

(Mathematician)

Frieth School Vision statement

"We are a close Christian community; nurturing, inspiring and celebrating all individuals. Through creative learning we encourage greatness by developing potential without limitations."

Values:

These are the Christian Values that you believe are both taught and learnt in our school. To be:

Sharing and caring

Gentle and Kind

Honest and Truthful

Challenging and Responsible

Maths Vision Statement:

"Developing confident, skilled and resilient mathematicians who will make significant contributions as global citizens."

Intent (aims)

School Aims

- To promote enjoyment of learning through practical activity, exploration and discussion.
- To promote confidence and competence with numbers and the number system.
- To develop the ability to solve problems through decision making and reasoning in a range of contexts.
- To develop a practical understanding of the ways in which information is gathered and presented.
- To explore features of shape and space, and develop measuring skills in a range of contexts.
- To understand the importance of mathematics in everyday life.
- To develop mathematical language which children can use appropriately.
- To help children to become independent learners.
- To provide a differentiated Mathematics curriculum which meets the needs of all children by offering a broad and balanced range of activities.
- To use ICT as a tool to enhance learning.

National Curriculum Aims:

Key Stage 1 & 2

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 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.

Key Stage 1 National Curriculum Attainment:

By the end of KS1 pupils should be able to:

- partition two-digit numbers into different combinations of tens and ones. This may include using apparatus (e.g. 23 is the same as 2 tens and 3 ones which is the same as 1 ten and 13 ones).
- add 2 two-digit numbers within 100 (e.g. 48 + 35) and can demonstrate their method using concrete apparatus or pictorial representations. The pupil can use estimation to check that their answers to a calculation are reasonable (e.g. knowing that 48 + 35 will be less than 100).
- subtract mentally a two-digit number from another two-digit number when there is no regrouping required (e.g. 74 - 33).
- recognise the inverse relationships between addition and subtraction and use this to check calculations and work out missing number problems (e.g. $\Delta - 14 = 28$).
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables to solve simple problems, demonstrating an understanding of commutativity as necessary (e.g. knowing they can make 7 groups of 5 from 35 blocks and writing $35 \div 5 = 7$; sharing 40 cherries between 10 people and writing $40 \div 10 = 4$; stating the total value of six 5p coins).
- Identify $\frac{1}{3}$, $\frac{1}{4}$ $\frac{1}{2}$, $\frac{3}{4}$ and knows that all parts must be equal parts of the whole.
- use different coins to make the same amount (e.g. pupil uses coins to make 50p in different ways; pupil can work out how many £2 coins are needed to exchange for a £20 note).
- read scales in divisions of ones, twos, fives and tens in a practical situation where all numbers on the scale are given (e.g. pupil reads the temperature on a thermometer or measures capacities using a measuring jug).
- read the time on the clock to the nearest 15 minutes.
- describe properties of 2-D and 3-D shapes (e.g. the pupil describes a triangle: it has 3 sides, 3 vertices and 1 line of symmetry; the pupil describes a pyramid: it has 8 edges, 5 faces, 4 of which are triangles and one is a square).

Key stage 2 National Curriculum attainment:

By the end of KS2 pupils should:

- demonstrate an understanding of place value, including large numbers and decimals (e.g. what is the value of the '7' in 276,541?; find the difference between the largest and smallest whole numbers that can be made from using three digits; $8.09 = 8 + 9/?$; $28.13 = 28 + \square + 0.03$).
- calculate mentally, using efficient strategies such as manipulating expressions using

commutative and distributive properties to simplify the calculation (e.g. $53 - 82 + 47 = 53 + 47 - 82 = 100 - 82 = 18$; $20 \times 7 \times 5 = 20 \times 5 \times 7 = 100 \times 7 = 700$; $53 \div 7 + 3 \div 7 = (53 + 3) \div 7 = 56 \div 7 = 8$).

- use formal methods to solve multi-step problems (e.g. find the change from £20 for three items that cost £1.24, £7.92 and £2.55; a roll of material is 6m long: how much is left when 5 pieces of 1.15m are cut from the roll?; a bottle of drink is 1.5 litres, how many cups of 175ml can be filled from the bottle, and how much drink is left?).
- recognise the relationship between fractions, decimals and percentages and can express them as equivalent quantities (e.g. one piece of cake that has been cut into 5 equal slices can be expressed as $1/5$ or 0.2 or 20% of the whole cake).
- calculate using fractions, decimals or percentages (e.g. knowing that 7 divided by 21 is the same as $7/21$ and that this is equal to $1/3$; 15% of 60; $1\frac{1}{2} + \frac{3}{4}$; $7/9$ of 108; 0.8×70).
- substitute values into a simple formula to solve problems (e.g. perimeter of a rectangle or area of a triangle).
- calculate with measures (e.g. calculate length of a bus journey given start and end times; convert 0.05km into m and then into cm).
- use mathematical reasoning to find missing angles (e.g. the missing angle in an isosceles triangle when one of the angles is given; the missing angle in a more complex diagram

Implementation

Maths Curriculum and the Maths Mastery Approach

Frieth school draws on the research and work completed by the National Centre For Excellence in Mathematics (NCETM) and the work of the Buckinghamshire, Berkshire and OXON Maths hub to support the development of the maths mastery approach in school. A central component of the NCETM/Maths Hubs programmes to underpinning teaching for mastery includes the 'Five Big Ideas'. These are:

Coherence

Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning, all steps being small steps

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation

Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation

Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

Frieth School has invested in the DfE approved maths scheme 'Power Maths' and uses the White Rose planning resources and NCETM materials to support the mastery approach to maths in school.

Planning

- Each teacher uses the National curriculum 2014 to inform their planning.
- Teachers follow appropriate Units or topics of work to cover Key Objectives for each year group, based on the White Rose Maths Resources.
- Medium term planning is laid out at the beginning of a new half term
- Teachers follow the Mathematical Calculations Policy which is available on the school website.
- Short term planning is flexible. Teachers adapt their weekly plans as appropriate to the needs of the children they are teaching.
- Teachers that share a class may take on different objectives in order to ensure progression and continuity within their class.
- Objectives for mixed age classes are considered for individual year groups. However, each child is planned for their personal needs as is felt appropriate by the class teacher.
- Planning within the school shares some key features; objectives, prior learning, differentiation to ensure the needs of all children are met, key vocabulary, assessment foci and some personalised tasks (as appropriate.)
- Teachers have a range of resources to support their planning and formative assessment, including: White Rose Maths Hub planning resources; Power Maths Scheme of work and online teaching tools; Target Maths books; Rising Stars Arithmetic; Twinkle resources; NRICH activities; NCETM planning guidance for mastery and Greater Depth; NCETM progression tables for each mathematical strand, Classroom Secrets resources.
- Learning support assistants take an active role in accessing daily plans and providing feedback for future planning.

Organisation of Mathematical Teaching and Learning

- At KS1 and KS2 teachers use the National Curriculum 2014 for teaching Mathematics and ensure that all parts of the Programme of Study are taught.
- Throughout the key stages a lesson of between 45 and 60 minutes is taught daily.
- Opportunities are taken to link mathematical experiences in other curriculum areas, particularly Science, technology and engineering. (STEM)
- The teacher groups the children according to ability and need. These groups are flexible to allow the teacher to meet the children's needs and challenge them, with the help of the learning support assistant if available.
- Guided group work takes place during the lesson.
- Teachers of the Reception class base their teaching on objectives in the Early Years Foundation Stage Framework; this ensures that they are working towards the 'Early Learning Goals for Mathematical Development'. Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with a 45-minute lesson

Resources

- Each class is equipped with a range of mathematical apparatus and materials to aid planning to which children have free access.
- Relevant courses are attended by all staff. Feedback is given and appropriate information is shared with staff.
- The senior teacher responsible for Mathematics manages the resources.

- All teachers organise an area within the classroom dedicated to mathematics resources. This area is easily accessible to all children and allows them to become familiar with all resources. Maths challenges are available in the classroom either on display or in a location that the children are aware of.
- Children will be given regular opportunities for free choice of resources in order to achieve a given objective.

SEND

We are an inclusive school. As with all subject areas, delivery of Maths is made to all pupils through Quality First Teaching, which takes into account the learning needs of all the children in the classroom. This includes providing differentiated work and creating an inclusive learning environment that is sensitive to the individual learning, emotional, social or economic needs of pupils. Pupils who receive 1:1 support will have access to support during Maths lessons as appropriate to their needs and Individual Education Health Care Plan (EHCP) and provision map.

- Lesson plans will take account of the differing needs of pupils with SEND.
- Children with SEND are taught within the daily mathematics lesson and are encouraged to take part when and where possible.
- Where applicable children's Provision Maps incorporate suitable objectives from the revised National Curriculum and teachers keep these objectives in mind when planning work.
- When additional support staff are available to support groups or individual children they work collaboratively with the class teacher.
- Within the daily mathematics lesson teachers not only provide activities to support children who find mathematics difficult but also activities that provide appropriate challenges for all children based on their individual ability and stage of learning in mathematics.
- Same Day interventions are used to provide additional input, clear misconceptions and enable pupils to be ready for the next stage of learning.

Equal Opportunities

- All children will be given equal opportunities. Activities are presented to children regardless of gender and cultural difference.
- In the daily mathematics lesson we support children with English as an additional language in a variety of ways. For example; repeating instructions, speaking clearly, emphasising key words, using picture cues, playing mathematical games, children to join in counting, chanting, finger games and rhyme.

Health and Safety

- Children are taught to use all apparatus with due care and awareness of other children.
- Shared resources in the EYFS and KS1 classrooms are cleaned and/or sterilised on a regular basis

Enrichment and the Wider Community

The PTA have funded the online subscriptions for a number of mathematical resources including:

- Times Table Rock Stars
- Matheletics
- Education City

Staff encourage pupils to get involved in national and international competitions through these online resources. Groups of pupils are involved in young enterprise schemes both in school as part of science and maths weeks, and with other schools at locally run events when available. Pupils are encouraged to find ways to raise funds for charities and to create items to sell at the Christmas fair.

Spiritual, Moral, Social and Cultural Development

The Maths curriculum and enrichment opportunities inherently support the spiritual, moral, social and cultural development of the pupils at Frieth through:

- Their sense of enjoyment and fascination in learning about themselves, others and the world around them
- Their use of imagination and creativity in their learning
- Their willingness to reflect on their experiences.
- Their understanding of the consequences of their behaviour and actions
- Their interest in investigating and offering reasoned views about moral and ethical issues and ability to understand and appreciate the viewpoints of others on these issues.
- use of a range of social skills in different contexts, for example working and socialising with other pupils, including those from different religious, ethnic and socio-economic backgrounds

Impact

Recording

Pupils record their work in a range of ways, photographs, concrete models, diagrams, on whiteboards and in books. There is a presentation policy for formal maths work in maths books.

Assessment

The Frieth Maths progression document enables staff to understand what pupils have learnt before, what they need to learn now and what they will learn next. (See Appendix 2) At Frieth we base the progression of calculation on the White Rose Maths Calculation policy. For progression in specific strands of maths, Frieth has adopted the NCETM progression tables.

Formative Assessment

Teachers use a variety of resources to assess mathematical learning formatively, including White Rose unit Assessments, Twinkl end of unit assessments, TT rockstars tests, Rising stars Arithmetic tests etc...

Summative Assessment

Three times per year, the pupils will sit an end of term summative assessment to check progress and analyse for gaps.

In the summer term, all pupils in years 1, 3, 4 & 5 sit the NFER summative maths assessment which provides a standardised score for tracking from year to year.

In year 2 and 6 pupils sit the statutory SATs assessments.

At the end of each school year, pupils will be assessed within one of the following bands: Pre-Key Stage (PKS); Working Towards the curriculum (WT); Working at Expected (EXP); Working at Greater depth (GDS).

Pupils will be expected to demonstrate all the core skills on the progression table relevant to their year group and attain a standardised score of 100 in NFER and SAT assessments to be assessed as EXP.

Pupils working at greater depth will be expected to utilise the expected level of development to explain, create and solve problems and provide their reasoning for their answers. They will be able to demonstrate how they are developing their mathematical learning through use of maths in other areas of the curriculum, including science. They will attain a standardised score of 120 in NFER summative assessments or a standardised score of 110 in SATs to be assessed as greater depth (higher standard)

Reporting

Pupils are given regular feedback; during lessons verbally or in the marking in their books. Peer feedback is

A final summative assessment for Maths will be reported to parents within the annual school report.

- Children are given regular feedback; during lessons, after lessons verbally or in the marking of books. Peer feedback is also utilised, and lessons start with time to correct and personalised learning sessions
- Parents are given feedback at parents' evening twice a year.
- An annual written report is provided during the summer term and parents are given opportunity to discuss their child's progress if required.

Monitoring

The maths subject leader is responsible for the monitoring of maths teaching, learning and outcomes across the school. The Maths subject lead will normally be a member of the Senior Leadership Team.

As a core subject, maths is featured in the yearly monitoring programme and is monitored throughout all year groups using a variety of strategies such as planning scrutinies, lesson observations, performances and pupil interviews.

Linked policies:

- Curriculum policy
- Learning and Teaching Policy
- Assessment policy
- Health and Safety Policy
- Equal Opportunities policy
- SEND policy

Appendix 1:

Calculation policy link <https://www.friethschool.co.uk/website/mathscurriculum/260387>

Appendix 2

Maths planning and strands of learning link

https://www.friethschool.co.uk/website/the_maths_curriculum/260389