

Bonneygrove Primary School Curriculum Guidance



Mathematics

Intent

At Bonneygrove Primary School, our curriculum is designed with the goal of all pupils achieving mastery in Mathematics, regardless of their starting point. We believe that Mathematics is a key skill that helps children make sense of the world around them. Children will develop a love of the subject and an ability to connect areas of learning and solve problems across our curriculum. Through carefully constructed planning, children will build solid foundations of understanding of number, reasoning, thinking logically and problem solving. They will apply these concepts to big questions, relating to real life situations, which will spark their imagination, curiosity and inspire enthusiasm in their learning journey. During this journey, children will acquire and demonstrate a confident grasp of the mathematics relevant to their year group, so that their learning is sustainable over time and can be built upon in subsequent years.

At Bonneygrove Primary School, we believe passionately that Mathematics is important in everyday life, many forms of employment, Science and Technology, medicine, the economy, the environment and development. Strong cross-curricular links, with Science and Computing, allow children to contextualise their learning and develop their problem solving skills. In History and Geography, children learn to understand that different cultures have contributed to the development and application of Mathematics. Today, the subject transcends cultural boundaries, and its importance is universally recognised.

Aims

- Believe in themselves as mathematicians and develop the power of resilience and determination when faced with mathematical challenges.
- Be a part of engaging and creative lessons that will give them a range of opportunities to explore various mathematical concepts.
- Have a secure sense of size and number and where it fits into the number system.
- Accurately and effectively recall number facts, such as number bonds and multiplication tables to calculate answers mentally.
- Calculate accurately and efficiently using a range of both mental and formal strategies.
- Recognise the operations needed to solve number problems including non-routine problems.
- Use mathematical vocabulary to explain their reasoning in order to develop oracy.
- Have a range of strategies to check whether answers are reasonable.
- Suggest sensible units for measuring and make sensible estimates.
- Explain and make predictions from the numbers in graphs, diagrams, charts and tables including those found through cross-curricular links.

Pupil Voice

"I like Maths because I like doing adding and subtracting. I can use inverse to help me too. I enjoy using bead strings, number lines, tens frames and part part whole models to help me. I know how to divide now too!"

AZ - Year 2

"I love maths because there are so many different strategies I can use to find my answer. In Year 5, I went to the Maths Challenge and you got top share strategies with the team to find the best way to get the answer. I want to do Maths at A level."

HT – Year 6

Implementation

Our approach to the curriculum is designed to develop children's knowledge, skills and understanding of mathematics from Early Years to Year 6. We do this through a daily lesson that has a mix of whole class and group teaching. At Bonneygrove, we use White Rose. The White Rose Maths curriculum is designed to provide students with a solid foundation in mathematics. Children gain a deep understanding of mathematics and enjoy solving mathematical problems. At Bonneygrove teachers take the schemes of learning provided and adapt them to the needs of the children in their classes.

During Mathematics lessons, children are encouraged to ask as well as answer mathematical questions. The mastery method is based on the idea that learning mathematics should be fun and enjoyable. It focuses on developing deep understanding rather than memorisation. This means that it helps children develop self-belief, persistence and resilience. All children have the opportunity to use a wide range of concrete resources such as number lines, Cuisenaire, digit cards and Base Ten to support their work appropriate to their age and ability level.

At Bonneygrove, children use ICT in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Wherever possible, we encourage the children to use and apply their learning in everyday situations.

In all classes, children of differing mathematical ability are given opportunities to develop curiosity and independence. We provide suitable scaffolding for learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in some lessons through differentiated group work and in other lessons by organising the children to work in pairs on open-ended problems or games, which helps develop their skill of collaboration. We aim to provide immediate verbal feedback to ensure that work is matched to the needs of individuals. Reactive interventions take place in the afternoon to ensure that all children meet the learning objective.

At Bonneygrove we do this through careful planning and preparation, ensuring that throughout the school,

- children are given opportunities for: practical activities, role play and mathematical games
- the development of mental and oral strategies with an emphasis on speed recall of number bonds and multiplication tables
- the development of mathematical vocabulary
- problem solving
- individual, group and whole class discussions and activities
- open and closed tasks using intelligent practice
- a range of methods of calculating including mental, formal and informal strategies
- understand mathematics through a process of enquiry and experiment
- regular use of ICT games to reinforce, develop and enthuse learning

Enquiry Drivers

At Bonneygrove Primary School, we aim to support a strong improving attainment agenda in Maths. The overarching goal is to raise attainment for all, while narrowing the poverty and SEN related attainment gap. We ensure that the aims of the national curriculum for mathematics are fundamental drivers for the Maths Curriculum. The national curriculum for mathematics aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time.
- Reason mathematically by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language.

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

Special Educational Needs

At Bonneygrove Primary School, we make reasonable adjustments for all our children (including those with SEND). In our school, we ensure that all of our children registered as SEND, including the provision of auxiliary, are not at a substantial disadvantage compared with their peers.

At Bonneygrove, we are guided by the SEND Code of Practice - Right Support, Right Place, Right Time March 2023. We recognise that each child has a specific need, including:

- Communication and interaction
- Cognition and learning
- Social, emotional, and health difficulties
- Sensory and/or physical needs

The above needs will be addressed through quality first teaching, effective differentiation, use of resources (primary and secondary), individual interventions, small group interventions, specialist provision and other supporting agencies.

Here at Bonneygrove, we ensure children with SEND have every opportunity to succeed and recognise that additional support may be required to ensure they progress and attain in line with their peers. We do this by utilising various strategies- e.g.

SEND area of need	Barrier to learning	Strategies
<ul style="list-style-type: none"> • Communication and interaction 	<ul style="list-style-type: none"> • Noise and movement-over stimulation • sharing equipment • amount of vocab • waiting and frustration • turn taking • maintain attention recording 	<ul style="list-style-type: none"> • Sufficient quiet space • Own set of equipment • Well planned transitions – i.e., between carpet and desk • Visual instruction • Worked examples • Movement breaks • Now and next/visual timetable • Ear defenders if needed • Sufficient quiet space • Well planned transitions – i.e., between carpet and desk • Visual instruction • Worked examples • Modelling • Movement breaks • Now and next/visual timetable
<ul style="list-style-type: none"> • Cognition and learning 	<p><u>Memory / Processing</u></p> <ul style="list-style-type: none"> • Amount of vocab • Recalling methods • Space between instruction and task <p><u>Cognition</u></p> <ul style="list-style-type: none"> • understanding of process, lang • retention/ application of number knowledge to task • recording vocabulary 	<ul style="list-style-type: none"> • Written/visual instructions • Clear worked examples • Well considered transitions • Audio instructions • Computer/iPad access <ul style="list-style-type: none"> • Word/definition bank • Sufficient quiet space • Well planned transitions – i.e., between carpet and desk • Visual instruction • Worked examples • Use of concrete resources (Numicon, cubes, counters Dienes etc.)

		<ul style="list-style-type: none"> Set sums out in books for the child if needed so that they can stay organised.
<ul style="list-style-type: none"> Social, emotional, and health difficulties 	<ul style="list-style-type: none"> Failure to complete task Frustration if task is too difficult 	<ul style="list-style-type: none"> Visual steps Pre and post teach 1:1 support Modelled examples Differentiation if appropriate so that child is successful Movement breaks Now and next/visual timetable
<ul style="list-style-type: none"> Sensory and/or physical needs 	<p><u>Visual Impairment</u></p> <ul style="list-style-type: none"> Difficulty reading Qs Difficulty seeing the modelled examples Tracking Difficulty reading q's, seeing shaded areas, seeing dashed lines May struggle with contrasting colours on the board <p><u>Hearing Impairment</u></p> <ul style="list-style-type: none"> Difficulty hearing explanation/ Instruction Difficulty in hearing instructions from teacher/peers Filtering noise to hear what is important Low self esteem Difficulty with vocabulary. <p><u>Dyspraxia</u></p> <ul style="list-style-type: none"> Difficulty recording and drawing Difficulty managing and using a range of resources to complete tasks. 	<ul style="list-style-type: none"> Adapted equipment Enlarged resources Larger squares in books Audio instructions Enlarged texts Technology for recording Training for staff Use of Braille if needed Separate screen linked to whiteboard Speak directly to child Peer support (vary the peer) <ul style="list-style-type: none"> Signing if needed Amplification of sounds Address acoustics Vocab lists and explanations Position within the class Simple instructions Task planners Ensure mini- mic is working and check hearing aids daily Interventions to actively teach relevant vocabulary Visuals and worked examples Working wall access <ul style="list-style-type: none"> Alternative ways to record computer, whiteboard and copy, photos Adapted equipment Set sums out in books for the child if needed so that they can stay organised.

Children at Bonneygrove, follow the early years foundation stage curriculum including the Mastering Number project. We give all children the opportunity to talk and communicate in a widening range of situation and to practise and extend their range of vocabulary and numeracy skills. They have the opportunity to explore, enjoy, learn about, and use mathematics in a wide and varied range of situations. Mathematics is planned on a weekly basis and assessed using the criteria from the early learning goals. Mathematics is taught both as a discrete subject and within the whole early years curriculum to give children opportunities to use their Numeracy skills in real life situations.

Key Stages 1 and 2

Daily maths lessons are between 45 minutes and one hour depending on the age of the children. There are medium term plans for each half term's work. There are also weekly plans, which cover the daily content of each lesson.

How do we plan for cultural capital?

At Bonneygrove, every child and family will have their own knowledge and experiences that link to their culture and wider family. Research shows that when children and families' culture is valued, both the child's experience of learning and progress can benefit (Hussein et al, 2018, p4 and Gazzard,E, 2018 in Chalmers, H and Crisfield, E 2019)

Cultural capital in Maths gives children power to help them achieve their goals, become successful, and rise up the social ladder without the necessary wealth and financial capital. It helps give children the desire to aspire and achieve social mobility whatever their starting point.

The implementation of the Mathematics curriculum includes opportunities for learners to develop skills relevant to the real world such as finance, cooking, history of numbers and fundraising. Opportunities include taking part in Children in Need and NSPCC Numbers Day fundraising, Maths after school clubs, Maths through Literacy weeks, Inspirational Maths Days, history of numbers in Egyptians and Ancient Greeks, etc. Year 5 have the opportunity to take part in the Hertfordshire wide Maths Challenge.

Impact

When children are ready to leave to their next phase of education, they will leave with a secure mastery of maths content, understanding of how to be morally, spiritually and culturally responsible. The children will be aware of making positive contributions to the local community and being the best they can possibly be.

In Maths, children will show confidence and believe that they will achieve well. Children will have the flexibility and fluidity to move between different contexts and representations in Maths. They will develop the ability to recognise relationships and make connections that relate to real life scenarios. Mathematical concepts and skills will be mastered when a child can show it in multiple ways, using mathematical vocabulary to explain their ideas. Children will be able to apply concepts confidently and independently to new problems in unfamiliar situations to achieve the learning objectives for their year group. Children will show a high level of pride in the presentation and understanding of their work.

We aim for our children to leave Bonneygrove respectful, skilful and ambitious with a thirst for learning and all it has to offer, so that they can strive for success throughout their lives.

Teaching Methods and Approaches

As we aim to improve pupils' outcomes, we consider measuring the effectiveness of our teaching crucial and therefore consistently endeavour to measure the impact we have on our students in various ways.

Lessons follow a Mastery approach with small steps teaching to enable children to achieve the learning objective. In reception, the aim is to have prepared the children by the end of the year for a daily 45-minute maths lesson.

The calculation policy is used within school to ensure a consistent approach to teaching the four operations over time.

Regular fluency lessons are timetabled across all key stages to ensure children develop long term memories of a variety of concepts.

The teaching of maths at provides opportunities for:

- *Group work*
- *Paired work*
- *Whole class teaching*
- *Individual work*

Children engage in:

- *The development of mental strategies*
- *Written methods*
- *Practical work*
- *Investigational work*
- *Problem- solving*
- *Mathematical discussion*
- *Consolidation of basic skills and routines*

At Bonneygrove, we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We ensure that age-related mathematical vocabulary is included within our planning. Children are expected to use it in their verbal and written explanations.

We endeavour to set work that is challenging, motivating and encourages curiosity to enable children to talk about what they have been learning.

Resources

At Bonneygrove, we use the Concrete Pictorial Abstract (CPA) approach. This is a system of learning that uses physical and visual aids to build a child's understanding of abstract topics. Pupils are introduced to a new mathematical concept through the use of concrete resources (e.g. fruit, Dienes blocks etc). When they are comfortable solving problems with physical aids, they are given problems with pictures. Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.

Resources are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally. There are central stores in both KS1 and KS2. There is also a variety of interactive resources to help with the delivery of Maths throughout the school and these are stored centrally on the staff network.

Contribution in Mathematics to Teaching in Other Curriculum Areas

English

At Bonneygrove, Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening.

Computing

The effective use of Computing can enhance the teaching and learning of mathematics when used appropriately. When considering its use, we take into account the following points:

- *Computing should enhance good mathematics teaching. It should be used in lessons only if it supports good practice in teaching mathematics;*
- *Any decision about using computing in a particular lesson or sequence of lessons must be directly related to the teaching and learning objectives for those lessons.*
- *Computing should be used if the teacher and/or the children can achieve something more effectively with it than without it.*

- *Useful suggestions as to integrating computing into units of work are given in the planning section of the Renewed Framework.*

Science

Almost every scientific investigation or experiment is likely to require one or more of the mathematical skills of classifying, counting, measuring, calculating, estimating and recording in tables and graphs. In Science children will for example order numbers, including decimals, calculate simple means and percentages, use negative numbers when taking temperatures, decide whether it is more appropriate to use a line graph or bar chart, and plot, interpret and predict from graphs. There is useful information within the Renewed Framework in relation to 'cross-curricular' aspects of Mathematics and Science.

Art, Design and Technology

At Bonneygrove, measurements are often needed in both Art and Design and Technology. Many patterns and constructions are based on spatial ideas and properties of shapes, including symmetry. Designs may need enlarging or reducing, introducing ideas of multiplication and ratio. When food is prepared a great deal of measurement occurs, including working out times and calculating cost; this may not be straightforward if only part of a packet of ingredients has been used.

History, Geography and Religious Education

In History and Geography children will collect data by counting and measuring and make use of measurements of many kinds. The study of maps includes the use of co-ordinates and ideas of angle, direction, position, scale and ratio. The pattern of the days of the week, the calendar and recurring annual festivals all have a mathematical basis. For older children historical ideas require understanding of the passage of time, which can be illustrated on a timeline, similar to the number line that they already know.

Physical Education and Music

At Bonneygrove, athletic activities require measurement of height, distance and time, while ideas of counting, time, symmetry, movement, position and direction are used extensively in music, dance, gymnastics and ball games.

Personal, Social and Health Education (PSHE) and Citizenship

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

Spiritual, moral, social and cultural development

The teaching of Mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We often group children so that they can work together, and we give them a chance to discuss their ideas and results. The study of famous mathematicians around the world contributes to the cultural development of our children. Mathematics contributes to children's spiritual development. Children can find shapes and pattern in nature. They can see the order, logic and pattern that numbers offer.

Assessment and Record Keeping

At Bonneygrove, we are continually assessing our children and recording their progress. We see assessment as an integral part of the teaching process and endeavour to make our assessment purposeful, allowing us to match the correct level of work to the needs of the children, thus benefiting the children and ensuring progress. Children in Year 6 will sit SATs papers at the end of every term with years 1, 2, 3, 4 and 5 sitting termly PUMA assessment papers. These results inform both subject leader and teachers of any gaps within their understanding. Class teachers regularly update INSIGHT against the objectives they are teaching the children in Mathematics.

Reporting

All parents receive an annual written report on which there is a summary of their child's effort and progress in mathematics over the year. Parents also have opportunities to discuss progress at two parent's evenings. Within

half-termly curriculum newsletters parents will receive information on new learning that will take place in mathematics for their child.

Equal Opportunities

At Bonneygrove as a staff we endeavour to maintain an awareness of, and to provide for equal opportunities for all our children in mathematics. We aim to take into account cultural background, gender and Special Needs, both in our teaching attitudes and in the published materials we use with our children.

Role and Responsibilities of Mathematics Subject Leader

- *Monitor planning, teaching and learning in mathematics, to ensure continuity and progression.*
- *Ensure there is well sequenced and progressive curriculum map which contains the key knowledge, skills and vocabulary children need to be procedurally fluent in mathematics.*
- *Monitor standards in mathematics throughout the school, including SEND, more able, LAC, etc.*
- *Identify strengths and areas for improvement and to lead and drive improvements within the school.*
- *Keep up to date with new initiatives and train staff on these (also to facilitate in or out of school training for staff).*
- *Feed back to the Headteacher on standards in mathematics*

Monitoring and Review

At Bonneygrove, the subject leader supports colleagues in their teaching, by keeping informed about current developments in mathematics, and by providing a strategic lead and direction for this subject; gives the headteacher an annual summary report in which he evaluates the strengths and weaknesses in mathematics and indicates areas for further improvement.

The subject leader uses allocated management time to review evidence of the children's work, and to observe mathematics lessons across the school. The quality of teaching and learning in mathematics is monitored and evaluated by the headteacher as part of the school's agreed cycle of lesson observations. A named member of the school's governing body is briefed to oversee the teaching of mathematics. The mathematics link governor meets regularly with the subject leader to review.