

Mathematics

Intent

At Bacton Primary School, our aim is for every child to develop the knowledge, skills, confidence and positive attitudes required to become a successful mathematician.

We want children to:

- use mathematics confidently in everyday life;
- develop secure number sense and fluency;
- think mathematically, creatively and logically;
- reason, explain and justify their thinking using accurate mathematical vocabulary;
- apply their knowledge to increasingly complex problems;
- make connections between different areas of mathematics;
- become independent and resilient learners who are prepared to take risks and learn from mistakes;
- develop the foundations required for success in mathematics at secondary school and beyond.

Our curriculum is designed around the three aims of the National Curriculum: **fluency, reasoning and problem solving**. We place a strong emphasis on number, place value, calculation and multiplication knowledge because these provide the foundations required to access the wider mathematics curriculum.

We aim to develop depth of understanding rather than simply accelerate pupils through content. Children are given opportunities to revisit previous learning, identify patterns and relationships, explain their reasoning and apply what they know in different contexts.

Mathematical talk is an important part of our curriculum. Key vocabulary is explicitly taught and modelled so that pupils increasingly communicate their mathematical thinking accurately and confidently.

We promote a culture in which mistakes are viewed as part of learning. Children are encouraged to persevere, reflect on misconceptions and understand that successful mathematicians do not always find learning easy first time.

Equality of Access and Ambition

All pupils, including pupils with SEND and disadvantaged pupils, are entitled to an **ambitious, meaningful and appropriately challenging mathematics curriculum**.

Our curriculum is adapted to enable pupils to access learning from their individual starting points without unnecessarily limiting mathematical ambition.

We recognise that equality of access does not mean that every pupil requires identical provision. Teachers identify and respond to barriers to learning while maintaining high expectations and supporting pupils to develop increasing mathematical independence.

Early Years Mathematics

Mathematical learning begins in EYFS, where children develop the foundations upon which later mathematical understanding is built.

Mathematics is developed through a combination of:

- high-quality adult-led teaching;
- meaningful play;
- practical exploration;
- mathematical talk;
- carefully planned continuous provision;
- opportunities to apply mathematics within everyday experiences.

Particular emphasis is placed on developing secure understanding of:

- number and numerical patterns;
- subitising;
- counting;
- cardinality;
- comparison;
- composition of number;
- pattern;

- shape and space;
- measures and comparison;
- mathematical vocabulary and reasoning.

Children use practical resources and representations to explore mathematical ideas and are encouraged to notice patterns, explain what they see and make connections.

The development of secure number sense in Reception provides an important foundation for later calculation and mathematical fluency.

Transition from EYFS to Key Stage 1

Progression from Reception into Year 1 is carefully considered so that pupils' existing mathematical knowledge is built upon rather than mathematics beginning again at the start of Key Stage 1.

Teachers consider children's EYFS experiences and starting points when planning Year 1 mathematics.

Practical resources, representations, mathematical talk and opportunities for exploration continue to be used as pupils move into Key Stage 1. Children gradually develop increasing confidence with formal mathematical recording while retaining access to concrete and pictorial representations where these support understanding.

This provides continuity between the EYFS curriculum and the National Curriculum and supports pupils to develop secure mathematical foundations.

Inclusion and SEND

At Bacton Primary School, we are committed to ensuring that all pupils, including those with SEND, can access meaningful and ambitious mathematical learning.

Pupils may have different starting points and may require adaptations to teaching, resources, representations or the amount of practice provided. Teaching is therefore responsive to individual need while maintaining high expectations for all pupils.

Support for pupils with SEND may include:

- carefully sequenced small steps;
- additional modelling;
- practical and concrete resources;

- pictorial representations;
- repeated practice and overlearning;
- reduced cognitive load;
- pre-teaching of vocabulary or concepts;
- stem sentences and worked examples;
- additional processing time;
- targeted adult support;
- carefully adapted independent work;
- opportunities to apply mathematics within familiar and meaningful contexts.

Where appropriate, pupils may work on mathematical objectives from an earlier stage of learning in order to secure essential foundational knowledge before progressing.

The aim is for all pupils to make meaningful progress from their individual starting points and to develop increasing independence and confidence as mathematicians.

Implementation

Curriculum and Planning

Our long- and medium-term planning is underpinned by **White Rose Maths**, which provides a clear progression of knowledge and skills across the school.

White Rose is used as a curriculum spine rather than a script. Teachers adapt resources according to:

- prior attainment;
- assessment information;
- identified gaps;
- the needs of individual pupils and groups;
- misconceptions;
- the pace at which pupils secure new learning.

Teachers select the White Rose slides that are relevant to the intended learning and supplement or replace these with their own modelling, examples, representations and questions where this will improve learning.

Irrelevant slides are removed so that teaching remains focused and purposeful.

Units may be adapted, revisited or extended where assessment shows that pupils need additional time to secure important concepts. Equally, pupils who demonstrate secure understanding are given opportunities to deepen and apply their knowledge through reasoning and problem solving.

Teachers ensure that National Curriculum content is covered and that learning builds progressively over time.

Consistent Lesson Structure

A consistent approach to mathematics teaching is used across the school so that pupils become familiar with the routines and expectations of a maths lesson.

Lessons generally include:

Embedding

Previous learning is deliberately revisited to support long-term retention.

Embedding activities are normally short and focused and may revisit learning from earlier in the week, term or year. The learning revisited does not have to be directly linked to the new learning for that lesson.

Teachers use pupils' responses formatively to identify whether knowledge has been securely embedded and whether further teaching or practice is required.

Fast Facts

Fast Facts provide a short opportunity to rehearse important mathematical knowledge.

These may include:

- number facts;
- multiplication facts;
- derived facts;
- vocabulary;
- mathematical definitions;
- stem sentences;
- key calculation facts.

Pupils actively respond rather than passively receiving information.

Learning Objective

The learning objective makes the mathematical focus of the lesson clear to pupils.

Mathematical Vocabulary

Vocabulary is explicitly identified and taught.

For a single-year-group lesson, approximately **three key words** are selected. In mixed-year-group classes, approximately **four key words** are selected, normally two relating to each year group's learning where appropriate.

Teachers:

- explain vocabulary explicitly;
- make links between everyday and mathematical meanings;
- model accurate mathematical language;
- expect pupils to use appropriate terminology when explaining their thinking.

Vocabulary Activity

In Key Stage 2, pupils regularly complete a short vocabulary activity before the main teaching input.

This develops confidence in:

- defining mathematical vocabulary;
- recognising vocabulary in different contexts;
- using key terms correctly;
- making links between related mathematical language.

Where pupils require additional support, vocabulary activities may initially be completed collaboratively with the teacher before pupils gradually develop greater independence.

Main Teaching Input

New concepts are introduced through carefully sequenced teaching.

Teachers:

- identify pupils' starting points;
- model concepts clearly;
- break learning into manageable steps;
- use worked examples;
- use questioning to check understanding;
- anticipate common misconceptions;
- make connections with previous learning;
- provide opportunities for pupils to explain their thinking;
- gradually move pupils towards greater independence.

Questions and examples are carefully sequenced so that pupils experience small changes between examples rather than unnecessary jumps in difficulty.

Concrete, Pictorial and Abstract Representation

Concrete, pictorial and abstract representations are used to develop conceptual understanding.

A range of manipulatives and representations are available, including:

- rekenreks;
- Base 10/Dienes;
- Numicon;
- counters;
- multilink cubes;
- Cuisenaire rods;
- bead strings;
- place value charts;
- tens frames;
- number lines and other visual representations.

CPA is not viewed as a rigid linear process. Pupils may move between concrete, pictorial and abstract representations according to the concept being taught and their individual level of understanding.

As pupils progress through the school, there is an expectation that they become increasingly confident working abstractly while still being able to access manipulatives and representations where these support understanding.

Broadly:

- EYFS and Key Stage 1 make extensive use of concrete resources;
- Years 3 and 4 increasingly connect concrete understanding with pictorial representations;
- Years 5 and 6 are increasingly expected to work abstractly, while using representations and manipulatives where they support understanding or address misconceptions.

For pupils with SEND, the representation used is determined by the pupil's mathematical understanding and individual need rather than solely by chronological age.

Mixed-Year-Group Teaching

Bacton has mixed-year-group classes, and teachers identify opportunities for pupils to learn together while ensuring that National Curriculum expectations for each year group are met.

Where appropriate:

- pupils complete Embedding and Fast Facts together;
- common vocabulary and concepts are explored together;
- the younger year group receives its focused teaching input while older pupils retrieve or practise previously taught learning independently;
- the older year group then receives its focused teaching input;
- independent work reflects the appropriate year-group objectives and individual starting points.

Teachers carefully consider where curriculum content can meaningfully be taught together and where separate teaching is required.

This enables pupils to benefit from shared mathematical discussion and consistent routines while ensuring appropriate progression for both year groups.

Fluency and Retrieval

Regular retrieval is an important feature of mathematics teaching.

Previously taught learning is revisited through:

- Embedding activities;
- Fast Facts;
- Early Morning Tasks;
- oral rehearsal;
- questioning;
- arithmetic practice;
- revisiting previous concepts within later units.

In Key Stage 2, Early Morning Tasks include regular arithmetic practice so that important calculation skills are continually revisited.

Retrieval is planned deliberately so that the gap between revisits gradually increases as knowledge becomes more secure.

Multiplication and Division Facts

Secure multiplication knowledge is essential because it supports calculation, fractions, ratio, proportion and many other areas of mathematics.

Pupils are supported to:

- count fluently in multiples;
- recognise patterns within multiplication tables;
- recall multiplication and corresponding division facts;
- use known facts to derive unknown facts;
- recognise multiples within larger numbers;
- make connections between multiplication facts.

Times Tables Rock Stars is used to support the development of multiplication fluency and pupils are encouraged to practise both in school and at home.

Teachers use information such as TTRS heatmaps to identify multiplication facts that require further teaching or practice and to respond to patterns of weakness within individual pupils or groups.

From Year 3, the **Number Sense multiplication programme** supports the development of conceptual understanding and fluent recall of multiplication facts.

The programme begins in Year 3 and progressively rolls through Key Stage 2.

Preparation for the statutory Year 4 Multiplication Tables Check is therefore rooted in developing secure understanding and recall over time rather than short-term test preparation.

Independent Practice, Reasoning and Problem Solving

Independent work gives pupils opportunities to practise, apply and deepen the learning introduced during the lesson.

Tasks are selected and adapted so that pupils can access the mathematics while still experiencing appropriate challenge.

Where a question or concept would benefit from a visual representation, pictorial support is included rather than relying unnecessarily on written or abstract presentation.

Support may include:

- concrete resources;
- pictorial representations;
- worked examples;
- scaffolds;
- stem sentences;
- adult support;
- reduced cognitive load;
- carefully selected questions.

Scaffolding is used to enable pupils to access the mathematical concept rather than reducing expectations unnecessarily.

Reasoning and problem solving are available to **all pupils** and are not treated solely as extension activities for those who finish fluency work quickly.

Pupils are regularly expected to explain:

- how they know;
- why a method works;
- whether a statement is true or false;
- what is the same or different;

- whether there is another method;
- how their answer can be proven.

Teachers also make expectations clear about what pupils should do once they have completed their initial task so that learning time is maximised.

Assessment and Responsive Teaching

Assessment is an integral part of mathematics teaching.

Teachers continually assess pupils through:

- questioning;
- pupil responses;
- observation;
- mathematical discussion;
- independent work;
- live marking and feedback;
- retrieval activities;
- arithmetic;
- low-stakes assessment;
- termly assessment information.

Misconceptions are addressed wherever possible during the lesson.

Where a misconception requires further teaching, this informs subsequent planning, retrieval or intervention.

Standardised and summative assessment information is used alongside teachers' ongoing formative assessment to identify:

- individual gaps;
- cohort strengths and weaknesses;
- pupils or groups requiring additional support;
- concepts requiring further teaching;
- pupils who require additional challenge.

Question-level analysis is used where appropriate to ensure that assessment informs future teaching rather than simply providing a score.

Assessment information is considered alongside professional knowledge of individual pupils so that teaching decisions are responsive and proportionate.

Supporting Identified Groups

Improving attainment and progress for identified groups is a key school priority.

Teachers use assessment information to identify gaps early and respond through high-quality classroom teaching in the first instance.

Support may include:

- additional modelling;
- manipulatives or visual representations;
- pre-teaching;
- same-day or short-term intervention;
- additional fluency practice;
- targeted retrieval;
- adapted independent work;
- carefully selected adult support.

The progress of identified pupils and groups is reviewed regularly so that provision can be changed where it is not having the intended impact.

Disadvantaged Pupils

The progress and attainment of disadvantaged pupils are monitored carefully through assessment analysis, pupil progress discussions and ongoing classroom assessment.

Teachers and leaders consider any barriers that may affect pupils' access to, engagement with or success within mathematics.

Where barriers or gaps are identified, support is targeted according to individual need. This may include:

- additional retrieval;
- pre-teaching;
- focused intervention;
- additional modelling;
- additional opportunities for practice;

- access to appropriate manipulatives and representations.

Disadvantaged pupils access the **same ambitious mathematics curriculum** as their peers. Adaptation and additional support are used to enable access and success rather than to reduce curriculum expectations.

The impact of support is reviewed so that provision can be adjusted where required.

SEND Provision

For pupils with SEND, mathematical learning is adapted according to individual starting points and identified areas of need.

Teachers consider what pupils need to know before they can successfully access new learning and ensure that essential prerequisite knowledge is secured.

Teaching may therefore involve:

- smaller learning steps;
- more frequent opportunities for practice;
- greater use of concrete and pictorial representations;
- explicit teaching and rehearsal of mathematical vocabulary;
- reduced quantity of questions where this supports sustained focus;
- carefully chosen examples that minimise unnecessary cognitive load;
- additional opportunities to revisit previously taught content;
- targeted adult modelling and support.

Where a pupil is working significantly below age-related expectations, teaching focuses on the mathematical knowledge and understanding that the pupil needs next rather than simply presenting age-related content that is inaccessible.

Teachers work with the SENDCo and relevant support staff where appropriate to ensure that provision reflects pupils' wider individual needs.

The aim remains for pupils with SEND to develop secure mathematical knowledge, confidence and increasing independence.

Professional Development and Staff Expertise

Consistent and effective mathematics teaching depends upon staff having secure subject knowledge and a shared understanding of the school's approach.

Staff receive ongoing professional development and support in mathematics. This may include:

- whole-school professional development;
- subject-specific training;
- coaching and professional discussion;
- modelling of effective practice;
- opportunities to observe mathematics teaching;
- moderation and discussion of expectations;
- sharing effective resources and approaches;
- support with planning and curriculum adaptation.

Professional development is informed by monitoring, assessment information, staff needs and school priorities.

Teachers and teaching assistants are encouraged to continually develop their mathematical subject and pedagogical knowledge so that they can confidently identify misconceptions, choose appropriate representations and support pupils' mathematical thinking.

The mathematics leader maintains an overview of staff mathematics training so that professional development can be targeted appropriately and gaps in subject knowledge or experience can be identified.

Mathematics Subject Leadership and Quality Assurance

The mathematics leader has a clear overview of the curriculum across the school and works with senior leaders and staff to ensure that the intended mathematics curriculum is being implemented effectively.

Quality assurance includes a range of activities, such as:

- lesson visits and observations;
- work scrutiny;
- planning scrutiny;
- pupil voice;
- assessment and data analysis;
- review of identified groups;
- monitoring of fluency and multiplication outcomes;
- professional discussions with staff;

- coaching and support;
- review of curriculum resources and provision.

Monitoring is used to evaluate both **what is being taught and how effectively pupils are learning it.**

The mathematics leader considers whether:

- curriculum expectations are consistent across classes;
- learning builds progressively;
- mixed-year-group provision enables both year groups to make appropriate progress;
- pupils are retaining previous learning;
- adaptations are enabling pupils to access the curriculum;
- identified groups are making appropriate progress;
- mathematical vocabulary and reasoning are being developed;
- agreed approaches are having the intended impact.

Findings from monitoring are used to identify priorities, provide support, inform professional development and refine the mathematics action plan.

Subject leadership therefore forms an ongoing cycle of:

monitoring → evaluation → action → review

rather than monitoring being an isolated activity.

Impact

The impact of our mathematics curriculum is evaluated through the progress pupils make from their individual starting points and the extent to which they develop secure, transferable mathematical understanding.

We expect pupils to increasingly:

- demonstrate secure knowledge of appropriate mathematical concepts;
- recall key number and multiplication facts with increasing fluency;
- retain previously taught knowledge;
- select appropriate methods and strategies;

- use mathematical vocabulary accurately;
- explain and justify their reasoning;
- identify and correct errors;
- make connections between mathematical concepts;
- apply mathematics in unfamiliar contexts;
- approach mathematical challenges with resilience and confidence.

Impact is monitored through:

- lesson visits and observations;
- work scrutiny;
- planning scrutiny;
- pupil voice;
- assessment information;
- question-level analysis;
- arithmetic and fluency information;
- multiplication data;
- statutory assessment outcomes;
- pupil progress discussions;
- monitoring of identified pupil groups.

Pupil voice is used to establish whether pupils understand their learning, recognise the importance of mathematics and feel increasingly confident as mathematicians.

Live feedback within lessons enables pupils to address errors and misconceptions quickly.

Regular retrieval enables pupils to revisit previous learning and supports the transfer of knowledge into long-term memory.

Mathematical knowledge is also applied across the wider curriculum, including subjects such as Science, Geography, Computing and Design and Technology.

Impact from EYFS into Key Stage 1

The impact of mathematics teaching begins to be seen through the mathematical foundations established within Reception.

By the end of EYFS, children should have developed increasingly secure early number sense and mathematical understanding that enables them to access the Key Stage 1 curriculum.

Teachers consider whether pupils can:

- recognise and represent quantities;
- subitise increasingly confidently;
- understand the composition of numbers;
- identify patterns and relationships;
- compare quantities and measures;
- use mathematical vocabulary;
- explain simple mathematical thinking;
- apply mathematical understanding through practical experiences.

Information from EYFS supports transition into Year 1 so that teachers build upon what pupils already know and can do.

Impact for Identified Groups

A central measure of impact is whether pupils and groups identified as priorities are making appropriate progress from their starting points.

Assessment and monitoring are used to establish:

- whether gaps are narrowing;
- whether classroom adaptations are effective;
- whether intervention is having an impact;
- whether pupils are retaining previously taught learning;
- whether pupils can apply their learning independently;
- what further action is required.

This includes explicit consideration of **disadvantaged pupils, pupils with SEND and other groups identified through school assessment and monitoring.**

Provision is adapted where monitoring shows that pupils are not making the expected progress.

Impact for Pupils with SEND

For pupils with SEND, impact is considered in relation to individual starting points as well as age-related expectations.

Evidence of successful impact may include:

- greater security in foundational mathematical knowledge;
- improved number sense;
- improved recall of key facts;
- increased independence;
- reduced reliance on adult support;
- successful use of concrete and pictorial representations;
- improved use and understanding of mathematical vocabulary;
- greater confidence when attempting mathematics;
- retention of previously taught learning;
- transferring knowledge into a new question or context.

Progress is monitored carefully so that adaptations and interventions can be changed where they are not having the intended impact.

High expectations remain in place, while success and progress are considered in the context of each pupil's individual needs and starting point.

Evaluating Curriculum Impact

The mathematics leader brings together evidence from monitoring, assessment and professional discussion to evaluate whether the mathematics curriculum is achieving its intended aims.

No single source of information is viewed in isolation.

Assessment outcomes are considered alongside:

- the quality of pupils' work;
- what pupils can explain and demonstrate;
- whether pupils remember previous learning;
- pupils' ability to apply knowledge in different contexts;
- pupil voice;
- classroom practice;
- the progress of identified groups.

This enables leaders to identify strengths, recognise where practice needs to improve and establish clear next steps for mathematics across the school.

The effectiveness of actions and professional development is subsequently reviewed to establish whether changes have improved teaching and pupil outcomes.

Long-Term Curriculum

White Rose Maths provides the basis of the school's long-term sequence and supports progression through the National Curriculum.

Particular importance is placed on establishing secure foundations in **number, place value and calculation**, as these underpin much of the later curriculum.

Long-term planning remains flexible.

Teachers may adjust the length or position of units when assessment demonstrates that pupils require further consolidation or when revisiting content at a later point would support retention.

Any significant adaptations are considered alongside the mathematics leader to ensure that statutory curriculum coverage and progression are maintained.

Progression begins within **EYFS**, where children establish the early number sense, pattern recognition, spatial understanding and mathematical language that underpin the Key Stage 1 curriculum. Knowledge is then progressively developed and revisited throughout Key Stages 1 and 2.

In mixed-age classes, teachers ensure that curriculum sequencing remains clear for each year group so that pupils build on prior learning and are prepared appropriately for the expectations of the following year.

The overall aim is not simply for pupils to have been exposed to curriculum content, but for them to **know more, remember more and be able to use their mathematical knowledge with increasing independence, fluency and confidence**.