Maths
@ Yewtree
Primary School

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Introduction

Importance of Maths

According to the National Curriculum (2013), 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.

Purpose

The purpose of this policy is to outline the way mathematics is taught at Yewtree School and the principles upon which mathematics is based. The policy ensures the school follows a consistent approach when teaching mathematics.

Aims

Linked with our school vision, 'Choosing to Learn, Growing Success,' our aim for mathematics at Yewtree is to develop hardworking, resilient and independent learners who enjoy maths and continuously work to achieve their full potential.

The National Curriculum for mathematics aims to ensure 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.

Outcomes

In mathematics at Yewtree we strive for all children to:

- develop their confidence, understanding and enjoyment in maths
- build upon their previous knowledge and skills to help progress their learning
- question and provide strong reasoning
- be experienced in using the concrete, pictoral and abstract methods
- be fluent and recognise the importance of the mental strategies and known facts that form the basis of all calculations

- work systematically where the task requires a careful accurate approach, as well as possess the ability to problem solve to show initiative and flexibility when appropriate

Expectations across the school

- All children to be challenged to their full potential
- Learning to be scaffolded as appropriate
- Learning to build on prior skills and knowledge obtained
- Each lesson to have a clear learning objective and success criteria (in child-friendly terms) and these need to be visible throughout the lesson
- Resources to be available every lesson and modelled to children how they can be used to support their learning
- Lessons to be interactive and involve lots of questioning.
- Lessons solely delivered using PowerPoint is discouraged.
- Clear role modelling by the teacher – using and displaying the appropriate vocabulary (see year groups' individualised vocabulary maps)
- CPA (concrete, pictorial and abstract) methods to be frequently used during lessons. This has been proven to ensure information and knowledge is internalised to a greater degree, resulting in more secure learning.
- Maths Learning Wall/ Working Wall to be visible in every classroom
- Teachers to 'track back' where necessary to address children's gaps in learning
- Interventions to take place as and when required with specific children
- There is not an expectation that work needs to be written in books every lesson – so long as progress can be evident in books. Some lessons may involve jottings on A3 paper, on whiteboards, journaling and partner-work etc.
- KS1 and KS2 to have 1 hour of maths daily plus an additional 15 minutes of Maths Fluency at a separate time to the maths lesson.
- Reception to have some form of mathematics four times a week for a minimum of 20 minutes. Children also have access to a variety of Maths activities during child-initiated learning, this is usually linked to the Maths being taught. Nursery do not have formal Maths sessions until Spring/ Summer, which then consists of some carpet time input. However, all year, they sing a lot of number songs and count during child-initiated learning.
- Fluency sessions to be balanced between re-activation and maintenance/ securing previous learning
- Years 2-6 to work on their 'Cracking Times Tables' every week

Learning environment and Working wall

Learning environments should be engaging and enable all learners to access the curriculum. The classroom should have both a working wall, as well as a maths fluency board.

All maths resources should be available to the children in clearly labelled drawers.

During lessons, concrete apparatus should be on tables to those children who will need them.

Maths working walls should include:

- Your class' maths learning journey
- Relevant, key vocabulary related to current learning
- Examples of teacher's modelling as well as children's work (e.g. strategies and methods)
- Vital steps in learning and key facts
- Sentence starters to promote discussion - only topics and methods that have been taught
- Walls should be a 'working' wall and should be updated frequently.
- Teachers should teach daily from their Working walls, e.g. set 1 minute challenges for children to complete and the wall should be meaningful and accessible to all children.

Classroom resources

- All classrooms have a number of mathematical, age-appropriate resources which will be clearly labelled for the children to readily access.
- These should be used regularly during lessons as part of the CPA approach and to support and secure learning.
- Children across all ability levels should be encouraged to use resources.
- Teachers should clearly model how the resources are expected to be used, a visualiser is available in each classroom.
- The Maths Subject Lead will have access to central resources if any additional resources are required. Calculators can be used in Upper key stage 2 as laid out in the National Curriculum (2013).

Maths Curriculum

For Years 1 to 6, mathematics at our school is based on the National Curriculum (2013) and for the Early Years Foundation Stage (EYFS), the EYFS framework (2021) informs mathematical learning.

From Reception through to Year 6 we consistently follow the Herts for Learning ESSENTIAL maths scheme.

Foundation stage

The programme of study for the Foundation stage is set out in the EYFS Framework (2021). Mathematics involves providing children with opportunities to develop and improve their skills in counting confidently, developing a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers and using numbers and numerical patterns.

Key Stage 1 and 2

The programmes of study are organised year by year for key stages 1 and 2 in the National Curriculum. The programme of study is organised into distinct domains, but pupils should make rich 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 skills and knowledge specified in the relevant programme of study.

T:\3 Subject Leadership\5 Maths\1 Curriculum\Curriculum progression maps

Scheme of Work

The HfL ESSENTIALS scheme of work that Yewtree follows links directly to the aims of the National Curriculum.

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. In June, all Year 4 pupils will sit a mandatory Multiplication Check Test. 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.

Maths Written Calculation policy

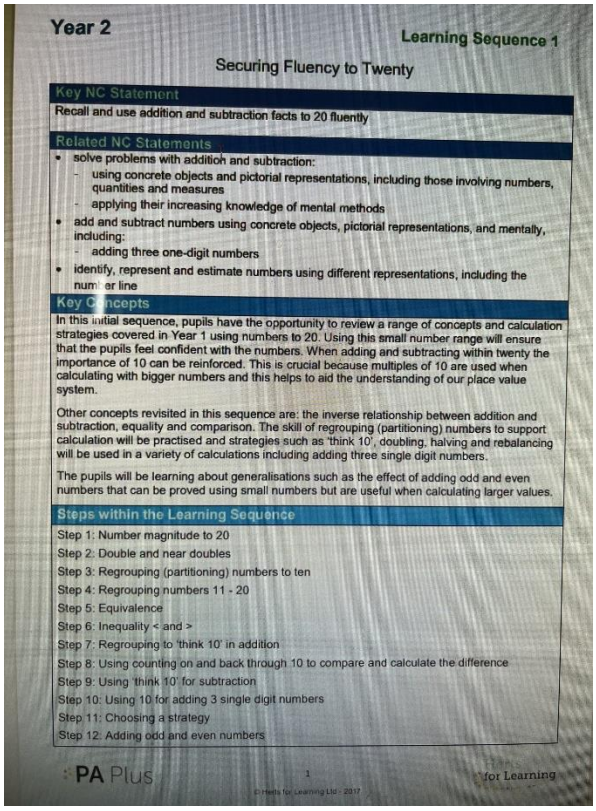
In conjunction with this Maths policy, Yewtree follows the HfL ESSENTIAL maths Written Calculation Progression document that links the key concrete experiences with pictorial and abstract representations (written symbolic and spoken). This supports pupils to move with confidence and deepen conceptual understanding through each strand of calculation.

Planning

Teachers will plan their lessons from the HfL ESSENTIALS learning sequences.

Here is an example of a Year 2 learning sequence

[Example of a Learning Sequence]



Year 2

Learning Sequence 1

Securing Fluency to Twenty

Key NC Statement

Recall and use addition and subtraction facts to 20 fluently

Related NC Statements

- solve problems with addition and subtraction:
  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures
  - applying their increasing knowledge of mental methods
- add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - adding three one-digit numbers
- identify, represent and estimate numbers using different representations, including the number line

Key Concepts

In this initial sequence, pupils have the opportunity to review a range of concepts and calculation strategies covered in Year 1 using numbers to 20. Using this small number range will ensure that the pupils feel confident with the numbers. When adding and subtracting within twenty the importance of 10 can be reinforced. This is crucial because multiples of 10 are used when calculating with bigger numbers and this helps to aid the understanding of our place value system.

Other concepts revisited in this sequence are: the inverse relationship between addition and subtraction, equality and comparison. The skill of regrouping (partitioning) numbers to support calculation will be practised and strategies such as 'think 10', doubling, halving and rebalancing will be used in a variety of calculations including adding three single digit numbers.

The pupils will be learning about generalisations such as the effect of adding odd and even numbers that can be proved using small numbers but are useful when calculating larger values.

Steps within the Learning Sequence

Step 1: Number magnitude to 20
Step 2: Double and near doubles
Step 3: Regrouping (partitioning) numbers to ten
Step 4: Regrouping numbers 11 - 20
Step 5: Equivalence
Step 6: Inequality < and >
Step 7: Regrouping to 'think 10' in addition
Step 8: Using counting on and back through 10 to compare and calculate the difference
Step 9: Using 'think 10' for subtraction
Step 10: Using 10 for adding 3 single digit numbers
Step 11: Choosing a strategy
Step 12: Adding odd and even numbers

PA Plus 1 for Learning

The plan follows a consistent format with clear emphasis on the National Curriculum statement being taught, related statements, key concepts of the unit and the steps within the sequence of learning.

It uses destination questions to provide children with assessment for learning opportunities.

It gives a clear step by step guide as to how to sequence the lessons on the learning journey.

It provides lesson ideas and resources that can be used.

These plans do not need to be copied and pasted onto a Yewtree planning format, however, teachers need to clearly annotate the sequences according to the needs of their class prior to teaching.

This planning needs to be shared in advance of the lesson with support staff.

Key methods and vocabulary need to be explicit on the plans.

Learning sequences need to be further annotated during the lesson and then used to mould and accelerate future learning.

Although the learning sequences and steps should be followed in the suggested order (see long term plan), they are not prescripted daily lessons and teachers should use their professional judgement to enhance and improve the lessons

Presentation Expectations

The children have a copy of the presentation expectations stuck in the front of their current maths book.

Maths Presentation Expectations in KS1

- We start a new page for each piece of work
- We only use pencil in maths books.
- We write the short day (DD/MM/YY) at the top left of our page
- The Learning Objective is written/stuck in at the top left of our page
- We write one digit per square
- Writing goes through squares
- We draw all straight lines with a ruler
- We work down the left-hand side of the page, leaving 2 lines between questions.
- We label question numbers in the margin
- We stick sheets in straight; they are not folded.

If work isn't presented in the expected way, it will obviously need to be repeated at lunch time or break time.

Maths Presentation Expectations in KS2

- We start a new page for each piece of work
- We only use pencil in maths books.
- We write the short day (DD/MM/YY) at the top left of our page, this is underlined with a ruler
- We write the Learning Objective 2 lines lower than the date and underline it with a ruler
- We write one digit per square
- Writing goes through squares
- We draw all straight lines with a ruler
- We work down the left-hand side of the page, leaving 2 lines between questions.
- We label question numbers in the margin
- We stick sheets in straight; they are not folded.

If work isn't presented in the expected way, it will obviously need to be repeated at lunch time or break time

Marking and Feedback

- Teachers do not need to thoroughly mark children's books every lesson.
- The sole focus on feedback and marking should be to further children's learning.
- Written comments should only be used where they are accessible to pupils according to age and ability.
- Feedback delivered closest to the point of action is most effective, and as such feedback delivered in lessons is more effective than comments provided at a later date.
- All pupils' work should be reviewed by teachers at the earliest appropriate opportunity so that it will impact on future learning (see 'Yewtree Primary School's Assessment for learning and feedback guidelines' for further guidance on feedback).
- Feedback will be based upon assessment for learning (AfL) within the classroom.
- It is vital that teachers evaluate the work that children undertake during lessons, and use information obtained from this to allow them to adjust their teaching. E.g. Mini-plenaries, co-operative feedback discussions, live marking during the lesson and pupil created success criteria.
- Codes will be used to describe the type of feedback given – see 'Yewtree Primary School's Assessment for learning and feedback guidelines' for guidance.
- Marking should be completed in pink, with suggested next steps in green. Purple should not be used as this is the colour the children edit and improve work with

Inclusion for all

Inclusion, Equal Opportunities and Interventions

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background. All class teaching is pitched at age-related level, however learning will be scaffolded and supported by staff to ensure all children can access the learning they are set. Maths interventions will take place during the afternoon and will be delivered by the Teaching Assistant. The class teacher will choose children who need to work on specific topics and/or methods and will plan the intervention for the Teaching Assistant to deliver. Class teachers will also ensure that children who are struggling on particular topics are supported during the lesson either by the teacher or the teaching assistant.

Children with Special Education Needs (SEN) and pupils working at Pre-Key-Stage levels

SEN children will have their specific needs met through differentiated work in conjunction with targets, e.g. linked to their Learning plans. Children who are not working at age-related level will have work that has been tracked back set for them and specific children who are working at pre-keystage levels will have their work tailored to match the pre-key-stage standard they are working at.

Gifted and Talented

Gifted and talented Children who are working well above the overall level of the class will be given a range of experiences designed to deepen their learning while working on the same learning objectives as their peers. This may be done by providing more demanding questions and investigations, further reasoning and problem-solving opportunities, and open-ended approaches to maths.

T:\3 Subject Leadership\5 Maths\1 Curriculum\Essentials Planning Scheme\Mastery documents

English as an Additional Language (EAL)

English as an Additional Language Children learning English as an additional language may need support in developing mathematical language and concepts. Care is taken to ensure that pupils are grouped according to their mathematical ability and not on their stage of language acquisition. Through the use of appropriate support and scaffolding, EAL pupils experience the same level of challenge as their peers.

Fluency

This guidance goes with the fluency sessions materials produced by Herts for Learning, to support schools in developing and running effective fluency sessions in mathematics.

These can be found on the school system: T:\2 Schemes of work\1 Maths - Essentials\5 Maths Fluency slides

Aims

The fluency sessions materials are designed to:

- rehearse core learning which has been previously taught, keeping it fresh over time
- increase the "facts at the fingertips", including base facts such as multiplication tables
- provide access to the age-related curriculum
- develop language and reasoning to secure understanding with sufficient depth

The materials for Year 1 to Year 6 are mapped to rehearse key concepts in the curriculum, over the school year. They also provide suggested key questions and adaptations to secure and embed the learning. Additional images and ideas are provided, to support the adaptations.

Fluency sessions are designed to be;

- led by the teacher, with the class
- for 10–15 minutes either 3–4 times per week, or daily if the timetable allows
- in addition to the daily maths lesson
- broadly pitched at age-related expectations, with some pre-teaching, where appropriate
- covering up to five areas (practice slides) during each session

The sentence stems and vocabulary lists can be used to develop precise mathematical language during fluency sessions and could be used across the school to form a consistent backbone of language for explanation and reasoning.

Teachers should use their ongoing assessment for learning to respond to the needs of the pupils.

Selecting slides from different sets within the year or from a previous year group could be used to:

- pre-teach an underpinning skill for a concept coming up in maths lessons
- secure understanding of a recently taught concept for all pupils, enabling further opportunity for securing and embedding the learning
- rehearsal of key skills across the year to secure the learning in long-term memory, for application across a range of contexts

Assessments

- Teachers use formative assessment to assess their pupils during every maths lesson using AfL, as well as Years 1-6 using summative assessments every term during Assessment week.
- Summative assessments consist of the HfL ESSENTIALS Diagnostic tests – see below.
- Both formative and summative assessment, alongside the Maths Assessment Framework are used to level each pupil at the end of each term.
- In year and across school moderation is also used to verify pupils' levels.
- Data is collected every term and pupils in Years 1-6 are assessed on their progress and attainment as either: 'Working Below,' 'Working Towards', 'Age-Related, or 'Working at Greater Depth'.
- Children in EYFS are assessed based on their development bands as either, 'Entering,' 'Developing,' or 'Securing' and whether they are expected to reach the 'Age-Related' level at the end of EYFS.
- Every term, Pupil Progress Meetings take place and specific children who need extra support to get 'back on track' with their learning will be identified.
- Targeted interventions by the teacher and teaching assistant will then be used to support these children.
- Formal assessments (SATs) take place in Year 2 and 6 and should be used to inform planning.
- In addition, a mandatory Multiplication Check for Year 4 pupils in Year will commence from June 2022.

HfL ESSENTIALS Diagnostics tests

- The diagnostic tests are based on the learning sequences taught by each year group each term. They consist of two papers – arithmetic and reasoning.
- The diagnostic materials are carefully designed to identify misconceptions and errors to directly inform the upcoming term's teaching.
- For this reason, there is no threshold 'pass mark'.
- However, outcomes from the tests will inform teacher assessment across the mathematics curriculum for each year group.
- Teachers can then consider how they will intervene with individual pupils, small groups, or the whole class.

The diagnostic materials can be found here... T:\2 Schemes of work\1 Maths - Essentials\3 HfL Summer Transition Programme\Diagnostic Materials

Mental maths

Children should be using their mental maths knowledge every day.

Although we do not expect a weekly mental maths test, there is a scheme available to you if required.

These are for Rising Stars and they are available to Year 1 – Year 6

It can be found here... T:\2 Schemes of work\1 Maths - Essentials\4 Mental maths tests

Cracking times tables and Timestable Rockstars

Cracking times tables

We encourage pupils to practise their times tables weekly.

Children will be assessed on a weekly basis using the 'Cracking Times Table' scheme (from Year 2- Year 6).

Once children have passed certain levels (1, 3, 6, 9, 12, 15, 18, 21, or 24) they would receive a certificate in the Celebration assembly on Friday. This information should be stored in a folder in each classroom.

We encourage parents and carers to support children with learning their times tables at home.

Timestable Rockstars

We have a subscription to Times Table Rock Stars (TTRS), which is an online resource that children can access at home and at school to work on their times tables.

Each pupil has an individual log in and password. Times Table Rock Stars helps to promote the importance of times tables across the school (mainly Year 2 to Year 6).

Each week we hold a battle of the bands to encourage the children to practice at home. The top 3 classes and top 3 rockstars will have their name on the TT Rockstars display in the dining room, as well as on the school website.

Vocabulary Maps

A comprehensive vocabulary map for each year group can be found in the shared area

T:\3 Subject Leadership\5 Maths\1 Curriculum\Key Vocab progression

Below is an example of the Herts for Learning ESSENTIALS sequence, the concepts involved and the key vocabulary used.

Essentials Sequence	Key concepts	Key vocabulary
2LS1 - Securing Fluency to Twenty	Building confidence with numbers 1-20, including addition and subtraction. Inverse relationship – addition and subtraction, equality and comparison. Regrouping (partitioning) numbers.	Re-group, bigger, smaller, double, times, plus, add, 'lots of,' part-whole, cherry model, equal, denominations, combinations, 'think 10,' complement, position, difference, subtraction, subtrahend, minuend, odd, even

Homework

Maths homework is set each week for children from Year 2 to Year 6.

The task set should be something that the children can complete independently and has been taught in class. It should not be new learning.

Home Learning tasks are available to use which tie in with the HfL ESSENTIALS learning sequences, using the similar language, models and question prompts.

Maths Everywhere cards are also available, and these cards are more family fun based, showing the children that maths is truly everywhere around us.

Year 1 have a piece of Maths homework set every other week.

T:\2 Schemes of work\1 Maths - Essentials\9 Maths Homework

Reporting to parents

All parents receive an annual written report on which there is a summary of their child's efforts and progress in maths over the year.

At the end of Key Stage 1 and Key Stage 2, each pupil's level of achievement against national standards is included as part of their annual written report.

Parents are invited to parent/teacher consultations in the Autumn and Spring terms to discuss their child's progress in maths alongside other subjects.

Parents will receive an indication of what level their child is working out during these meetings.

There are also 'Meet the Teacher' opportunities the throughout year where parents will have the opportunity to speak to their child's teacher to discuss their learning and progress in maths.

While the above formalities take place throughout the year, parents are welcome to speak to their child's teacher regarding any questions or concerns they have about their child in relation to maths at any point throughout the year.

The Maths Subject Lead is Michael Crisp –who can be contacted at: Mcrisp@yewtree.herts.sch.uk for any maths related questions.

Monitoring and Evaluation

The Maths Subject Lead, alongside the Senior Leadership Team (SLT), are responsible for monitoring and evaluating progress against the maths curriculum.

This is done through informal drop-in sessions, book scrutiny, planning scrutiny, lesson observations, pupil voice, staff discussions and analysis of progress and attainment data.