



The Fairlawn Haseltine Federation
Mathematics Policy

At Fairlawn and Haseltine, we strive to put the magic into learning so that pupils develop mathematical fluency, reasoning and problem solving skills. We promote a love and enjoyment for maths and believe that all children can achieve.

Our vision

Our vision for the teaching and learning of mathematics at Fairlawn and Haseltine is underpinned by the principles of “mastery”. Our intention is:

- to provide stimulating and engaging maths lessons which meet the needs of all children;
- for children to have a resilient and positive ‘can do’ attitude towards mathematics;
- for children to become fluent in the fundamentals of mathematics, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately;
- for children to develop a range of mental and written strategies, selecting the most efficient method when answering questions;
- for mathematical language to be embedded throughout our curriculum;
- for children to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language;
- for children to 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;
- to provide opportunities for children to make connections between mathematical concepts;
- to have the CPA approach built-in to our lessons, using a range of models and manipulatives to develop both procedural fluency and conceptual understanding.

Maths Curriculum

At Fairlawn and Haseltine Primary School, we use a mastery approach in the planning and teaching of maths. Our maths curriculum is designed to develop children's knowledge and understanding of mathematical concepts from Early Years Foundation Stage through to the end of Year 6.

We use the expectations outlined in the National Curriculum, the DFE Ready to Progress Criteria and the NCETM Prioritisation Curriculum to ensure coverage and progression in mathematical knowledge and skills across the school. This allows pupils to build a deep understanding of concepts, which will enable them to apply their learning in different situations. Please see a snapshot of our KS1 and KS2 curriculum progression below. (The full document is available on the school drive and on the website).

KS1 and KS2 Fairlawn Maths Curriculum Progression

	Year 1 (See NCETM Curriculum Prioritisation overview)	Year 2 (See NCETM Curriculum Prioritisation overview)	Year 3	Year 4	Year 5	Year 6
Number and place value	<ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number (unit 1 & 2) count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens (unit 2 & 3) given a number, identify one more and one less (unit 3) identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least (unit 2) read and write numbers from 1 to 20 in numerals and words. (unit 5 & 6) 	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward recognise the place value of each digit in a two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use and = signs read and write numbers to at least 100 in numerals and in words use place value and number facts to solve problems. (Unit 1) 	<ul style="list-style-type: none"> count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number recognise the place value of each digit in a three-digit number (hundreds, tens, ones) compare and order numbers up to 1000 identify, represent and estimate numbers using different representations read and write numbers up to 1000 in numerals and in words solve number problems and practical problems involving these ideas. (Unit 2) 	<ul style="list-style-type: none"> count in multiples of 5, 7, 9, 25 and 1000 (fluency and unit 4) find 1000 more or less than a given number count backwards through zero to include negative numbers recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 identify, represent and estimate numbers using different representations round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of the above and with increasingly large positive numbers read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. (Unit 1) 	<ul style="list-style-type: none"> read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 solve number problems and practical problems that involve all of the above read Roman numerals to 1000 (M) and recognise years written in Roman numerals. (Unit 1) 	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 and determine the value of each digit round any whole number to a required degree of accuracy use negative numbers in context, and calculate intervals across zero solve number and practical problems that involve all of the above. (Unit 1)
Addition and subtraction	<ul style="list-style-type: none"> read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 + ___ = 9. <p>(Unit 7 – addition and subtraction facts within 10. To 20 will be covered in year 2→)</p>	<ul style="list-style-type: none"> solve problems with addition and subtraction: <ul style="list-style-type: none"> using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> a two-digit number and ones a two-digit number and tens two two-digit numbers adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot 	<ul style="list-style-type: none"> add and subtract numbers mentally, including: <ul style="list-style-type: none"> a three-digit number and ones a three-digit number and tens a three-digit number and hundreds add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction estimate the answer to a calculation and use inverse operations to check answers solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (Unit 4) 	<ul style="list-style-type: none"> add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate estimate and use inverse operations to check answers to a calculation solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. (Unit 2) 	<ul style="list-style-type: none"> add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) add and subtract numbers mentally with increasingly large numbers use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. (Unit 2) 	<ul style="list-style-type: none"> perform mental calculations, including with mixed operations and large numbers use their knowledge of the order of operations to carry out calculations involving the four operations solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving addition, subtraction, multiplication and division use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. (Unit 2 & daily 'Fluent in Five')



At the beginning of the year, each year group teacher is given a long-term overview of the mathematics units for the year (see example below). This ensures all concepts are built on previous knowledge to ensure foundations are fully secure. Children spend longer on key mathematical concepts, most noticeably number. Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. These documents have been designed with the guidance of the National Curriculum, NCETM Prioritisation Curriculum, DFE Ready to Progress criteria

and White Rose SOL. Our curriculum is flexible on timings to ensure we meet the needs of all children. There are opportunities planned throughout the curriculum to revisit previous learning to ensure it is deeply embedded in pupils' memories.

Year 3 Maths Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	13
Autumn	Unit 1 Adding and subtracting within 10		Unit 2 Place value			Unit 3 Numbers to 1,000	Unit 3 Numbers to 1,000		Unit 4 Addition and subtraction				
Spring	Unit 4 Addition and subtraction		Unit 5 Multiplication and division			Unit 5 Multiplication and division	Unit 6 Money	Unit 7 Statistics		Unit 8 Length			
Summer	Unit 9 Fractions					Unit 10 Time	Unit 10 Time		Unit 11 Properties of shape		Unit 12 Mass and capacity		

Number	Measurement	Geometry	Statistics
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Year 3 Maths Curriculum 2021-22



Within the curriculum map (available on the school drive and on the website), each unit is broken down into small, logical steps, enabling connections to be identified and built upon. These steps are explored through clear mathematical representations and real life contexts. Lessons are slower paced to allow children to move through the learning at broadly the same pace, developing a sound understanding as they do so.

Year 3 maths curriculum map 2021-22

COVID Recovery Curriculum

NCETM prioritisation curriculum/ NCETM spines/ White Rose SOL/ DFE Ready to Progress criteria have all been used to support the planning, teaching and learning of mathematics.

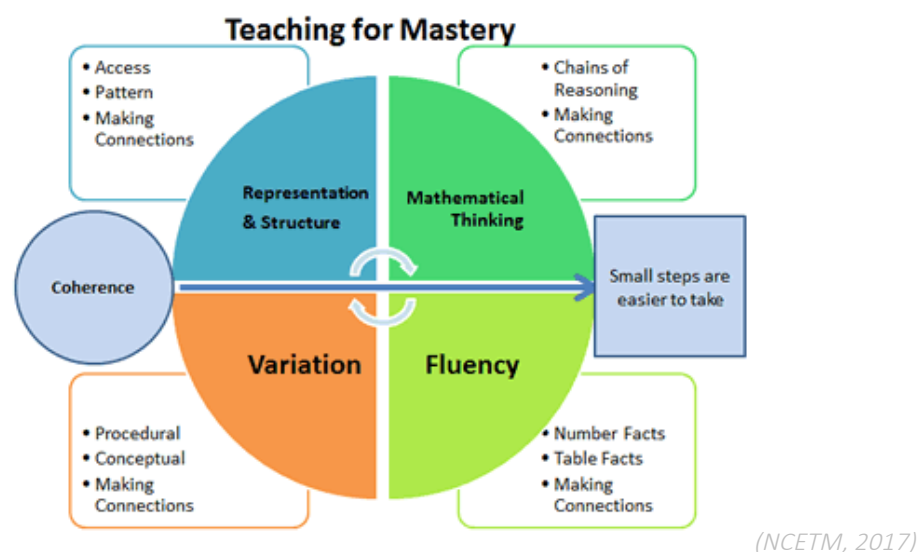
Rough suggestions are given for the intended length of each unit, but teachers are expected to adjust according to the needs and prior learning of their pupils.

	Unit	Unit name	Learning outcomes/ small steps	Links with other resources
Autumn 1	1 (2 weeks)	Adding and subtracting across 10 NCETM prioritisation unit 1	(NCETM - unit 1) 1) Pupils add 3 addends 2) Pupils use a 'First...Then... Now' story to add 3 addends 3) Pupils explain that addends can be added in any order 4) Pupils add 3 addends efficiently 5) Pupils add 3 addends efficiently by finding two addends that total 10 6) Pupils add two numbers that bridge through 10 7) Pupils subtract two numbers that bridge through 10	2AS-1 Add and subtract across 10. 3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice. 1.11 Addition and subtraction: bridging 10
	2 (3 weeks)	Place Value White Rose	1) Pupils will represent numbers to 100 using concrete materials. (Representing numbers to 100) 2) Pupils will use a part-part whole model to explore partitioning and recombining tens and ones to make a total. (Tens and ones) 3) Pupils will explore hundreds. (Hundreds) 4) Pupils will represent numbers to 1,000 using Base 10. (Numbers to 1,000) 5) Pupils will present different 3-digit numbers in various ways. (100s, 10s and 1s) 6) Pupils will present different 3-digit numbers using place value counters (100s, 10s and 1s) 7) Pupils will estimate, work out and write numbers on a number line. (Number line to 1,000) 8) Pupils will find 1, 10 and 100 more or less of a given number. (1, 10 and 100 more or less than a given number) 9) Pupils will use concrete materials to represent numbers to 1,000. They will use comparative language and symbols to determine which is greatest/ smallest. (Compare objects to 1,000)	- 3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10. - 3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning. - 3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10. - 1.18 Composition and calculation: three-digit numbers

Fairlawn Primary Maths Curriculum 2021-22



We use the NCETM's '5 Big Ideas' to support the planning and teaching of maths.



Fluency

We have a strong emphasis on mental calculation. Key facts, such as multiplication tables and addition facts within 10, are learnt to automaticity to avoid cognitive overload in the working memory and to enable pupils to focus on new concepts. We plan to develop children's understanding by connecting new knowledge with existing knowledge. We have 3 x 15 minutes additional fluency sessions in KS2 and 4 x 10min additional fluency sessions in EYFS and KS1 each week. This year, we are taking part in the 'Mastering Number' Reception and KS1 project with the NCETM.

Fluency Overview 2021-22

	<i>Autumn 1</i>	<i>Autumn 2</i>	<i>Spring 1</i>	<i>Spring 2</i>	<i>Summer 1</i>	<i>Summer 2</i>
Reception	Please see Mastering Number overview.					
Year 1	Please see Mastering Number overview.					
Year 2	Please see Mastering Number overview.					
Year 3	(2x) 4x	(4x) 8 x	3x	(3x) 6x	(6x) 12x	Revision
Year 4	9x	7x	11x	Squares	Revision	Test in June
Year 5	Mixture of times tables	Identify multiples and factors including factor pairs and common factors	Recall prime numbers to 19	Identify prime numbers and prime factors to 100	Recognise and use square and cube numbers	Revision
Year 6	Mixture of times tables (Focusing particularly on the 36 most important facts) Using these known facts to multiply decimals and multiples of 10 or 100. (e.g. $4 \times 8 = 32$, so $0.4 \times 8 = 3.2$ etc)					
	Identify multiples and factors including factor pairs and common factors	Recall prime numbers to 19 Identify prime numbers and prime factors to 100	Recognise and use square and cube numbers	Review all (Use teacher assessment)	Review all (Use teacher assessment)	Review all (Use teacher assessment)



Maths lessons

Daily maths lessons are delivered through quality first teaching. Children are taught through whole-class interactive teaching, where the focus is on all children working together on the same lesson content at the same time. During these lessons, children are supported to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems, as well as giving all children the confidence and resilience to achieve this. Throughout the lesson there is a balance of children and teachers explaining and reasoning mathematically. The 3 aims of the National Curriculum are highly connected throughout children's learning to ensure children develop conceptual and procedural understanding.

Fluent in Five

We have a strong focus on developing fluency in arithmetic skills. In Year 2-6, we start each maths lesson with 'Fluent in Five'. Children are provided with a range of quick, daily arithmetic questions to build number fluency and confidence with mental strategies and written methods to complete in five minutes. It recaps prior learning from the current year and previous year groups.

Fluent in Five

5 mins

COUNTDOWN

5:40

100 3 2 1 3 8

1) $98.7 + 9.49 =$

2) $1440 \div 120 =$

3) $4,464 \div 36 =$

4) $371 \times 28 =$

5) $82 \times 4 =$ $\times 8$

6) How many days are there in November?

7) What is 10 more than -7?

8) CXXIV =

Key

▲ Try mentally first.

■ Try a written method.

(Year 6 'Fluent in Five' example)

Concrete – Pictorial – Abstract (CPA) approach

There are opportunities for children to develop their understanding of concepts through the use of concrete manipulatives and pictorial representations alongside numbers and symbols – this helps them to visualise, understand new concepts and make connections. Initially, and when appropriate, we provide children with concrete manipulatives and pictorial representations to secure their early understanding of mathematical concepts. Careful planning goes into what the most appropriate representations are used to develop children's conceptual understanding. Children are given lots of opportunities, to discuss, explore, practice and apply mathematical

concepts using these resources. We carefully consider when these manipulatives and representations are removed so children can develop automaticity of the concepts.

Language in Mathematics

During maths lesson there is a focus on the acquisition of mathematical language so, where appropriate, generalisations and stem sentences are generated. These are then displayed around the classroom to support future learning. This also supports the children when they are reasoning and justifying their answers in problem solving, as they can explain their understanding using correct mathematical language.

Vocabulary Poster

$\text{addend} + \text{addend} = \text{sum}$
$\text{minuend} - \text{subtrahend} = \text{difference}$
$\text{factor} \times \text{factor} = \text{product}$
$\text{product} \div \text{factor} = \text{factor}$
$\text{dividend} \div \text{divisor} = \text{quotient}$

Year 1- 3

$\text{addend} + \text{addend} = \text{sum}$
$\text{minuend} - \text{subtrahend} = \text{difference}$
$\text{factor} \times \text{factor} = \text{product}$
$\text{product} \div \text{factor} = \text{factor}$
$\begin{array}{r} \text{quotient} \\ \text{divisor} \overline{) \text{dividend}} \end{array}$

Year 4- 6

Examples of STEM sentences

I say, you say, you say, you say, we all say



World
Continents
(Country Outline)

part
whole

If the world is the **whole**, then, South America is a **part** of the world.



The whole is split into _____ equal parts
and _____ parts are shaded.

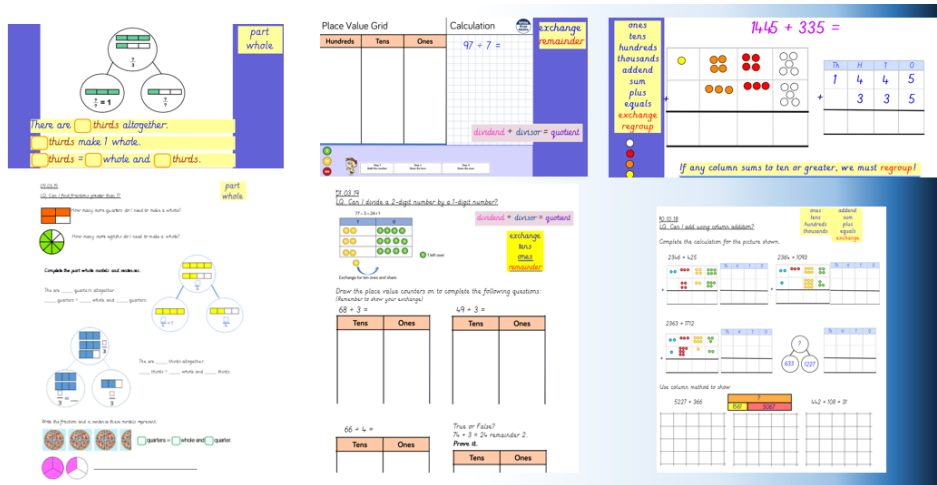
equal
part
whole
fraction
numerator
denominator

$$15 + 10 = 25$$

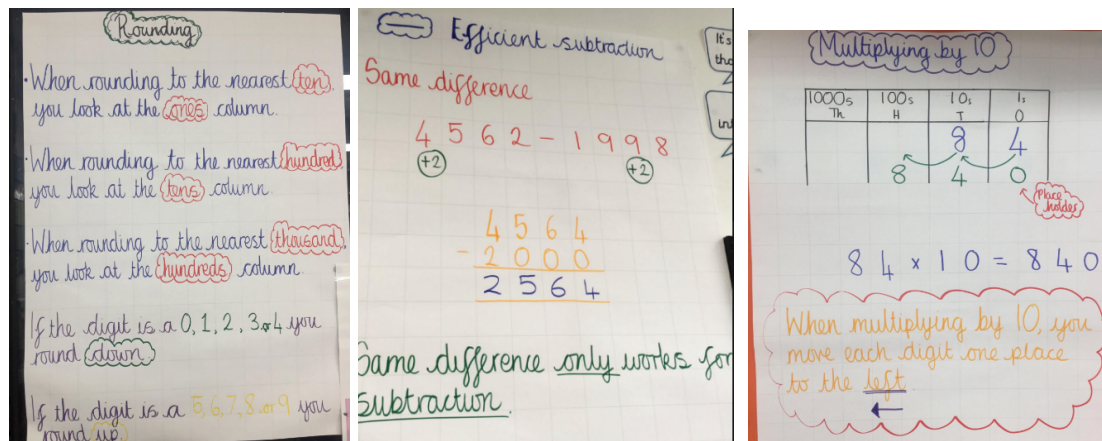
$$16 + 10 = 26$$

When adding 10 to a number,
the ones digit stays the same.

Vocabulary and STEM sentences are also displayed on flipcharts and independent learning sheets.



Models, vocabulary and STEM sentences will also be displayed on learning walls for children to refer to.



STOPS Problem solving

We believe that "Problem Solving" is at the very heart of the maths curriculum. Although problem solving is taught throughout the curriculum, we teach an explicit problem solving lesson each month. We use STOPS '8 problem solving strategies' to develop children's skills in completing a range of problems. The skills learnt in these sessions support children with problem solving in everyday maths lessons.

Meeting the needs of all

At Fairlawn and Haseltine we are an inclusive school, that is creative in supporting children to access the learning in class, providing adaptations where needed. Support or early intervention is provided for children who do not grasp a concept, and

challenge (rather than acceleration) is provided for those children who can explore concepts at greater depth. These children are challenged to reason at a greater level that is required or with a rich and sophisticated problem when appropriate. Furthermore, we do not “set” for maths lessons and children sit in mixed ability pairings.


Assessment

Summative Assessment


Regular ongoing and end of term assessments take place to support teachers in tracking progress. We adapt our own End of Unit assessments, using the NCETM assessment questions (which closely link with the RTPs), Testbase and White Rose end-of-block assessments. The assessments help identify any gaps in learning and check that children have grasped concepts at an appropriate level of depth. Teachers can use these assessments to determine gaps in children’s knowledge and use them to support future planning and provide interventions.

End of unit assessment: Numbers 10 to 100

1. How many cookies are there?



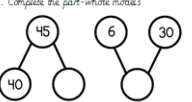
2. How many cakes are there?



3. Match the numerals to the correct words using lines.

13	Thirty
30	Thirty-three
33	Thirteen

4. Complete the part-whole models



5. Circle the greatest number:

18 27 33 19 23

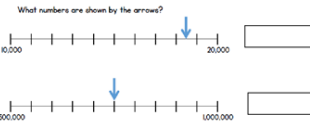
6. Complete the sentence with either **more** or **less** to make it correct.

3 tens is _____ than 2 tens and 12 ones.

(Year 2 End of Unit Assessment)

Year 5
End of Block Assessment: Place Value

1) What numbers are shown by the arrows?



2) Complete the missing numbers.

127,084 = 100,000 + 20,000 + _____ + 80 + 4

_____ = 7000 + 500 + 3

3,050,020 = 3,000,000 + _____ + 20

3) Complete the table.

	Round 39,476
to the nearest 10,000	
to the nearest 1,000	
to the nearest 100	

4) What is the **smallest** digit that can be used to make this statement correct?

34,3__8 > 34,359

5) What is 35 ones + 35 tens? _____

(Year 6 End of Unit Assessment)

6) a) The length of four rivers is shown in the table.

River	Length in km
Mississippi	6,275
Saint Lawrence	3,098
Nile	6,853
Rio Grande	3,057

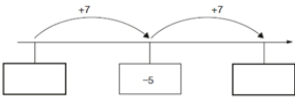
Put the rivers in order of their length starting with the shortest.

b) Round the length of the Mississippi river to the nearest 100 km.

_____ km

7) Here is part of a number line.

Write the missing numbers in the boxes.



8) Here are four number cards.

2 3 4 7

Layla uses each card once to make a four-digit number.

She places:

- 4 in the tens column
- 2 so that it has a higher value than any of the other digits
- the remaining two digits so that 7 has the higher value.

Write a digit in each box to show Layla's number.

At the end of a term, each child in years 1- 6 will complete the NTS End of Term ‘arithmetic’ and ‘reasoning and problem solving’ assessment papers. These scores are recorded on our MARK tracking spreadsheet. We use SHINE to identify any necessary interventions for individual children or groups of children for what has already been taught. We use this data to support future planning.

Sample page from Mathematics, Year 2, Paper 1

To view a full sample brochure, visit www.pearson.com/uk/teachers/assessments

5

$41 - 1 =$

1 mark

6

$13 - 9 =$

1 mark

Sample page from Mathematics, Year 4, Paper 2

13

What is the **perimeter** of this square?

3.5 cm

cm

1 mark

14

Kyle, Dev, Joe and Samir play a computer game. This table shows the points they scored.

Kyle	Dev	Joe	Samir
6,939	6,943	6,897	6,928

Tick the correct order of scores which has the **highest** scorer first.

1st	2nd	3rd	4th
Kyle	Dev	Joe	Samir
Dev	Samir	Kyle	Joe
Dev	Kyle	Joe	Samir
Dev	Kyle	Samir	Joe

1 mark

These assessment are used to support teachers judgments on pupil progress and attainment.

Formative Assessment

Where appropriate, pupils will be self-marking with a calculator and / or peer-marking throughout the lesson. Teachers and TAs will also mark throughout the lesson individually or whole class. This gives pupils instant feedback and allows them to act upon errors and misconceptions during the lesson. It also gives teachers a clearer picture of progress through the lesson and at the end of the lesson. These in-class assessments also inform planning for the coming lessons.

When marking, we use the following stampers:

*You are ready
for new learning.*

This stamper is used when pupils are secure with their learning and ready to move on.

*Further consolidation
needed.*

This stamper is used when pupils are doing well but require further practice.

*You need some
support with this.*

This stamper is used when pupils are struggling with a piece of learning and require further input. This could take place in the next lesson or as a separate intervention.

We will revisit this learning.

This stamper would be used if you have reached the end of a maths unit and the pupil has still struggled to grasp a secure understanding. Children will then receive an intervention for this in the future.



Our Green Pen Learning (GPL) stamp is only to address misconceptions or expand on reasoning. There should be **NO** next step.

Maths books

Our maths books show what children have learnt individually and independently. It will show whether pupils have understood a concept that they have been taught and the level of depth to which they have understood it. This helps us make decisions for our future planning. For example, reteach something in a different way or move on to the next learning.

Not every lesson will have evidence in children's books. Sometimes, particularly at a start of a sequence of lessons, we may spend more time on learning and may not record in books. The learning evidenced in books is progressive and shows conceptual and procedural variation.

In our books, you should also be able to see, that some children have been given more support and some children are challenged to reason at a greater level of depth than others, and some children at a greater level of depth than is required of all pupils in that year group.

Interventions

Maths interventions are fluid and rapid, ensuring that children's misconceptions are dealt with as soon as possible. If children need further consolidation, they may receive a same day or next day intervention.

In KS1, all children have a maths passport that focuses on their fluency skills. This is also continued where appropriate in KS2.

Third Space Learning is an intervention we use in Year 5 and 6.

Home learning

We believe that home learning should be enjoyable, collaborative, interesting and challenging. Home learning should not be stressful or onerous and should not lead to conflict between children and parents. We encourage and support our parents to enrich their children's maths learning through promoting a love of maths outside of school. It is important that children see the connections of maths in their everyday lives. A range of ideas can be found on our parent handout packs found on our school website.

In Key Stage 1 and 2, we set weekly home learning for maths. The home learning will be a consolidation of what the children have been learning in class.

We also have subscribed to Sumdog, TTRockstars and Numbots to encourage pupils to practise their mental maths skills.

Continued Professional Development

We provide professional development for all staff that focuses on subject and pedagogical knowledge. Professional development is ongoing and is delivered in school through INSETs, staff meetings, team planning and team teaching. We also use the NCETM Professional Development materials to help develop teacher subject knowledge and enable teachers to deliver teaching for mastery with confidence. Additionally, we engage in ongoing professional development opportunities provided by the London South East Maths Hub.